STEM Safety Rules

Nativity School STEM consists of a variety of engaging topics that students investigate in a lab setting. However, any science or STEM activity may have potential safety issues if not conducted properly. Safety in the classroom is an important part of the scientific and engineering processes. To ensure a safe learning environment, the list of rules below has been discussed with all students. We expect that students follow all these rules at all times.

- 1. Conduct yourself in a responsible manner at all times in the science room. Fooling around, practical jokes, teasing, and pranks will not be tolerated.
- 2. Follow all written and verbal instructions carefully. Ask your teacher questions if you are not sure what to do.
- 3. Do not touch any equipment, supplies, specimens, or other materials in the science room without permission from the teacher.
- 4. Perform only teacher approved experiments and activities. There will be times when you will be asked to design your own experiment, but teacher approval is required before you begin collecting data. You are not allowed to change the method after it is approved without getting additional teacher approval. Do not conduct any experiments when the teacher is out of the room.
- 5. Never eat, drink, chew gum, or taste anything in the science room.
- 6. Be careful when using the science equipment so that the equipment or your hands are not touching your face, eyes, and mouth. Wash your hands with soap and water after conducting science experiments and activities (hand sanitizer is not an acceptable substitute).
- 7. Wear safety goggles when instructed. Never remove safety goggles during the middle of an experiment or before all other materials are cleaned up. Putting away the goggles should be the last thing you do at the END of a lab.
- 8. Keep your work area and the science room neat and clean. You will be responsible for cleaning up all laboratory materials before you leave the room at the end of the class period.
- 9. Return all equipment, clean and ready for the next class, to where you got it from.

- 10. Dispose of all waste materials by following the teacher's instructions. Different types of waste material have to be disposed of in different ways.
- Report any accident (fire, spill, breakage, etc.), injury (cut, burn, etc.) or hazardous condition (broken equipment, students not following directions, fooling around, etc.) to the teacher IMMEDIATELY.
- 12. Consider all chemicals in the science room to be dangerous. Do not touch, eat, drink, smell, or play with any chemicals unless specifically instructed to do so.
- 13. Handle all animals, living or once-living, with care and respect.
- 14. Always carry a microscope with both hands. Hold the arm with one hand and place the other hand under the base.
- 15. Treat all required supplies, specimens, and tools with care and respect.
- 16. Never open storage cabinets or enter the storage room without permission from the teacher.
- 17. Do not remove chemicals, equipment, supplies, or animals from the science room without permission from the teacher.
- 18. Handle all glassware with care. Never pick up hot or broken glassware with your bare hands.
- 19. Dress properly long hair must be tied back. When not in uniform there can be no dangling jewelry, no loose or baggy clothing, and no sandals. Wear lab aprons when instructed.
- 20. Learn where the safety equipment is located, when it should be used, and who is allowed to use the equipment. Know where the exits are located and what to do in case of an emergency or fire drill.

The Correct Way To Use A Safety Shower In An Emergency

How to Use a Safety Shower

In the event of an emergency involving corrosive substances, it is crucial to know how <u>safety showers</u> are operated. The moment a corrosive chemical comes into contact with skin, it begins to cause tissue damage - and the damage becomes more serious with each passing second. That's why it's so important to make sure your staff know exactly when and how to use safety showers before the unthinkable happens.

When to use a safety shower

Safety showers are designed to mitigate the damage caused by exposure to corrosive, injurious substances. Corrosive chemicals include the following:

Common Injurious Corrosive Materials	Workplaces Frequently Exposed to Corrosive Substances:						
Hazardous electric storage battery electrolyte(s)	Construction sites and commercial and manufacturing facilities where batteries are serviced and handled for forklifts and other machinery						
Formaldehyde	Industries that manufacture, distribute, or sell hair straightener, paper towels, photographic film, shampoo, deodorant, toothpaste, lipstick and nail polish, some glues, composite panel products, automobiles, various forms of inks, wrinkle-free fabrics, building materials, and more						
Sulfuric Acid (also known as battery acid)	Landscaping, automotive, farming, industrial cleaner manufacturing, and warehousing						
Sodium Hydroxide (also known as lye or caustic soda)	Textiles, bleach/soap/detergent manufacturing, aluminum production, drain cleaner manufacturers						
Anhydrous Ammonia	Refrigeration, laboratories, pharmaceuticals, and petroleum						
Hydrochloric Acid	Chemical laboratories						
Pesticides, herbicides, insecticides, etc.	Farming, landscaping, nurseries and greenhouses, agriculture						
Chlorine (bleach)	Manufacturers of bleach, janitorial services, hospitals, pool and spa companies						

While this list is not exhaustive, it should give you a good idea of the sorts of chemicals involved. If you think you work with a corrosive chemical but don't have access to safety showers, speak to your health and safety officer.

Once a corrosive chemical comes into contact with skin - no matter how small an amount - it is extremely important to use a safety shower as soon as possible. In accordance with the ANSI Z358.1 regulations, safety showers must be installed no more than a 10-second walk away from the hazardous area. See our <u>guide to the ANSI regulations</u> for more information.

Operating a safety shower can be very disruptive, and many people worry that using a safety shower will draw undue attention to themselves, or be seen as 'making a fuss' - but it really is better to be safe than sorry. Upon exposure to corrosive chemicals, tissue damage can occur surprisingly quickly, and once the damage is done, it's irreversible. Even small amounts of these chemicals can cause permanent scarring and life changing injury, so it's always better to err on the side of caution.

Before using a safety shower

Once exposure has occurred, don't delay - make your way to the safety shower as quickly as possible. It bears repeating that the longer a corrosive chemical is in contact with flesh, the graver the injury will become.

Before entering the safety shower, it is important to remove all clothing and jewelry. Fabrics can become easily saturated with harmful chemicals and keep them in close contact with the skin, causing severe injuries.

Of course, most people feel uncomfortable about the idea of stripping naked in front of their work colleagues, but removing clothing is an essential part of the decontamination process - and besides, protecting yourself from injury is more important than saving face.

Operating a safety shower

Safety showers are designed to be simple to use. Most are operated by means of a pull lever. Once the lever has been pulled, the shower will discharge water at a specific rate and volume for at least 15 minutes, in line with the ANSI regulations.

You should stay under the stream of water for at least 15 minutes to ensure thorough decontamination. It is advisable to stay in the shower for as long as possible until medical help arrives.

When using the safety shower, be careful not to get the stream of water into your eyes, since the rate at which it is discharged is enough to cause damage. If your eyes have been contaminated with an injurious substance, you should thoroughly sluice them using an eyewash station. A combination safety shower and eye wash unit should be used in situations where both the skin and eyes have been contaminated.

In some cases, the water provided by an outdoor safety shower may be discoloured by rust; however, this is no cause for concern, and you should enter the shower immediately, rather than waiting for the stream to run clear.

For more information on safety showers, including different shower types and installation guidelines, visit our <u>ultimate guide to emergency showers</u>.

Posted by Iconography Ltd 2nd October 2017

User Guide: How To Use An Emergency Eye Wash Station

How to Use an Eyewash Station in an Emergency

In an emergency scenario, an <u>eyewash station</u> can save your sight - if it's properly used. Such accidents are fortunately very rare, but it's paramount that you and your colleagues are prepared should the worst happen. Read on to find out how to use an emergency eye wash unit the right way



Don't delay

The second a hazardous material enters your eyes, you should make your way to an eyewash station. According to <u>ANSI regulations</u>, these should be located no more than a ten-second walk away from any hazard. All safety equipment should also be clearly signposted. Make sure you know the location of relevant safety fixtures before handling any hazardous substances.

Don't hesitate, even if it's only a minor spill - the longer a hazardous substance is in contact with the eye, the more damage it does. Even small amounts of contamination can cause serious injury and even permanent loss of vision.

Activate the unit

Push the activation lever on the eyewash station. In order to be compliant with ANSI regulations, the lever will be clearly marked and operable with a single easy motion. All staff should already have been shown how eyewash stations are activated.

When the lever has been pushed, the dust covers will pop open and each of the two eyewash nozzles will begin discharging water.

Flush out your eyes

Once activated, the eyewash station will continue to discharge water for a minimum of 15 minutes, meaning that it can be operated hands-free.

Using your fingers to keep your eyelids open, lower your eyes into the stream of water issuing from the nozzles. Roll your eyes gently up and down and from side to side, ensuring that the water reaches as much of the eyeballs as possible.

Contact lenses

If you wear contacts, gently remove them once you have begun the flushing process. While failing to remove contact lenses can prevent the eye wash from properly irrigating the eyes, it is important not to delay flushing in order to take them out. Only do this once flushing has begun.

Keep on flushing

Continue to use the eyewash station in this manner for a full 15 minutes, and no less. This is the minimum amount of time that it takes to sufficiently clear the eyes of harmful chemicals - if you remove your eyes from the stream before this time has elapsed, you run the risk of permanent injury.

After flushing

When the 15 minute flushing period is over, seek medical assistance immediately. Have a colleague drive you to the accident and emergency department of your local hospital. Do not be tempted to drive yourself, as your vision may be impaired.

Posted by Iconography Ltd 26th October 2017



Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 www.LabLearner.com

MSDS No.: AA0025 Revision Date: April 1, 2008 Approved by: James A. Bertsch

MSDS No.: AA002	5		~	photeo py. Dames	A. Denson
Section 1	Chemical Product and	Company Inf	ormation		
Product	ACETONE				
Synonyms	2-Propanone; Dimethyl ket	one; Solvent			
CHEMTREC 2	4 Hour Emergency Phone Numbe	er (800) 424-930	0		
Section 2	Composition / Information	ition on Ingred	lients		
Che	emical Name	CAS#	%	TLV Unit	<u>s</u>
Acetone		67-64-1	100%	TWA: 500 ppm; S1	"EL: 750 ppm (ACGIH 2001)
Section 3	Hazards Identification				
Emergency Ov	erview			0 = Minimal	Health 2
	TREMELY FLAMMABLEI			1 = Slight	Fire 3
	AND SKIN IRRITATION. tore near heat, sparks or flame.	Keen container (losed Lise	2 = Moderate	Reactivity 0
	d area. Avoid contact with skin a			4 = Severe	Contact 1
repeated breat	o 1				HMIS *
Section 4	Central nervous system. First Aid Measures				
INGESTION: C	all physician or Poison Control C nel. Never give anything by mou				by appropriate
INHALATION: Get medical at	Remove to fresh air. If not breath ention.	ning, give artificia	al respiration.	If breathing is difficul	lt, give oxygen.
	F: Check for and remove contact r eyelids occasionally. Get imme			n water for at least 15	minutes, lifting
SKIN CONTAC get medical atte	T: Remove contaminated clothin ention.	g. Flush thoroug	ahly with mild	soap and water. If in	itation occurs,

Section 5 Fire Fighting Measures

General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Fires involving a small amount of combustibles may be smothered by dry chemical. Acetone is extremely flammable and its vapors form explosive mixtures with air. Dangerous when exposed to heat, sparks, flame or oxidizing agents,

Extinguishing Media: Carbon dioxide, dry chemical, water spray, alcohol foam. Flash Point: ~ 20°C (~4°F) Closed Cup

Section 6 Accidental Release Measures

Autoignition temperature: 465°C (869°F)

Explosion Limits: Lower: 2.5% Upper: 12.8%

Use proper personal protective equipment as indicated in Section 8. Remove all sources of ignition. Provide adequate ventilation. Recover for use if not contaminated. Absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

(2004 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.9, GUIDE PAGE NO. 127)

Section 7 Handling & Storage FLAMMABLE STORAGE CODE RED

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Handling: Use with adequate ventilation. Avoid contact with eves, skin and clothing. Avoid ingestion. Do not inhale vapors, spray or mist. Wash thoroughly after handling. Remove and wash clothing before reuse, Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

Exposure Controls / Personal Protection Section 8

Engineering controls: Facilities storing or utilizing this material should be equipped with an evewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, googles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: Use a chemical fume hood and/or wear a NIQSH/MSHA-approved respirator.

Section 9 Physical & Chemical Pro	perties
Physical state: Liquid.	Boiling point: 56°C (133°F)
Appearance: Clear, coloriess.	Freezing / Melting point: ~95°C (~139°F)
Odor: Pungent odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Complete.
Vapor pressure (mm Hg): 180	Specific gravity (H ₂ O = 1): 0.8
Vapor Density (Air = 1): 2.00	Percent volatile (%): 100%
Evaporation rate (Butyl acetate = 1): 7.7	Molecular formula: CH ₃ COCH ₃
Viscosity: N/A	Molecular weight: 58.08
Section 10 Stability & Reactivity	
Chamical stability, Stable	Hezerdeus nehrmerizetten. Mill wet eesur

Chemical stability: Stable

Hazardous polymerization: Will not occur. Conditions to avoid: Excessive temperatures, heat, sparks, open flame and other sources of ignition.

Incompatibilities with other materials: Chloroform, chromic anhydride, hydrogen peroxide, nitric compounds, acids, strong oxidizers, alkalies.

Hazardous decomposition products: Oxides of carbon.

Toxicological Information Section 11

Effects of overexposure: Inhalation of this material is irritating to the eves, nose and throat. High vapor concentrations may result in headache, dizziness and nausea. Repeated skin contact causes defatting and chapping and drving. Contact with eves causes severe irritation, redness and swelling. Slightly toxic by ingestion, Causes nausea, vomiting, headache, dizziness and unconsciousness. Aspiration hazard. Repeated or prolonged exposure may cause liver and kidney damage.

ORL-RAT LD50: 5800 mg/kg IHL-RAT LC50: 50100 mg/m3/8H SKN-RBT LD50: 20 g/kg

Section 12 Ecological Information

Do not flush into surface water or sanitary sewer system. Non-toxic to aquatic life. Beadily biodegradable.

Section 13 Disposal Considerations These disposal guidelines are intended for the disposal of catalog-size guantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: UN1090 Shipping name: Acetone

Hazard class: 3

Packing group: II

Exceptions: Ltd Qty • 1 Lt.

Section 15 Regulatory Information

TSCA-listed, EINECS-listed (200-662-2), RCRA code U002

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards,

1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -



		MATERIA	AL SAFE	TY DA	TA SHEET	SECTIO	DN V	Н	EALTH HAZAR	D DATA			AA0135
	earne	Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101	MSDS		AA0135 136 AA0143 AA0144 145 AA0146 AA0147	Threshol	d Limited V	alue _T	WA: 10 mg/m ³ (ACGI⊢	2001) as alu	minum met:	al dust.	
		www.LabLearner.com 1.877.LEARN78	Effectiv		anuary 1, 2007	Effects o	f Overexpos		IGESTION: May caus				
SECTIC	DN I	NAME	24 HOUR EN	IERGENC	Y ASSISTANCE			C	inimize potential hazar ause injury to the corne	a. INHALAT	ION: It has	been reported	in the
Product	Aluminum M	letal		CHEMTREC					terature that chronic ex ausing lung injury. Tar				acted of
Chemical Synonyms	Granular, St	not, Sheet, Strips, Turnings		800-424-930 ay 585-226-61		Emergen	cy and	·					
Formula	AI	<u>, , , , , , , , , , , , , , , , , , , </u>	-	uy 000 220 01	Reactivity 1		Procedures	·	NGESTION: Call physi omiting only if advised	by appropriate	e medical pe	ersonnel. Neve	er give
Unit Size	up to 2.5 Kg	· · · · · · · · · · · · · · · · · · ·	– NFPA HAZARD BATI	NG	HMIS *	anything b with water	y mouth to an u for at least 15 r	inconsciou ninutes, lit	s person. EYES: Che ting upper and lower ey	ck for and ren relids occasio	nove contac	t lenses. Flush	thoroughly
C.A.S. No.	7429-90-5		- MINIMAL SLIGH		SERIOUS SEVERE	SKIN: Re	move contamin	ated clothi	ng. Flush thoroughly w	ith mild soap	and water.	If irritation occu	urs, get
SECTIC		INGREDIENTS OF	MIXTURES	_			ve oxygen. Get		lemove to fresh air. If r ttention.	iot breathing,	give aralicia	a respiration. In	breatning is
Principal (Component(s)	c	%	TLV Units	SECTIO	DN VI	R	EACTIVITY DA				
Alumin	um metal		>99	9.5 S	ee Section V.	Stability	Unstable	x	Conditions to A	void		ark, flame, wate xidizing agents.	
		1-8-71-8-8-0-14	-			Incompa	Stable tibility		}				75.7.1.
CAUTI	ON! INHALAT	ION AS DUST OR FUME MAY CAU	JSE IBBITATION				s to Avoid)	Stron	g oxidizers, acids, alka	lies, halogena	ated compou	unds, heat and v	water.
SECTIO		PHYSICAL DATA				Hazardou Decompo	us Disition Prod	lucts	Aluminum react	s with water,	acids or alk	alies to generat	e hydrogen.
Melting Poir		660°C (1220°F)	Specific Gravity (H2O	= 1)	N/A	Hazardous	s Polymerizal	tion	Conditions to A	void			
Boiling Poin		N/A	Percent Volatile		N/A	May Occu		ot Occur			Not appl	icable.	
	sure (mm Ha)	N/A	by Volume (%) Evaporation Rale		N/A	SECTIO		x S	PILL OR LEAK	DROCEL	NIRES		
Vapor Dens		0.095 - 0.113 lb/in ³	(=1)			-	be taken in			THOOLE			
Solubility in		Insoluble.					is released					erial onto paper.	
Appearance		Silver gray colored metal, granul	ar shot sheet stri	ns turnings	No odor				fiber carton.	Wash spill ar	ea well with	soap and wate	ır.
SECTIO		FIRE AND EXPLOS				Waste Di	sposal Meth	nod Dis	scharge, treatment, or dispesse disposal guidelines are	sal may be sub	ject to Federa	al, State or Local I	aws.
Flash Point (Method Used)) ^	Flammable I % by Volum	_imits in Air	Lower	Upper								
Extinguisher				L				Di	spose of in accordance	with federal,	state and to	cal regulations.	1
Media		enated extinguishing agents should ater. Ring small fire with sand, elimi				SECTIO			PECIAL PROTE				
SPECIAL F	REFIGHTIN	G				Respiration F (Specify Type) M	SHA-appr	d in normal laboratory oved dust mask or wor	nandling. If d k in ventilation	usty condition 1 hood.	ons prevail, wea	ar a NIOSH/
PROCEDU	RES					Ventilatio	n Local Exi	haust xal (General	Recommended.	Special Other	N	o. o.	
		In fire conditions, wear			contained	Protectiv			Rubber.	Eve Prote		Chemical safe	tv olasses.
		breathing apparatus an	o na protective cio	uning.		Other Protect	ive Gor	ndes safe	ty glasses, lab coat, fire	- extinguisher	i		- <u>, , , , , , , , , , , , , , , , , , , </u>
						Equipment SECTIO						station.	
UNUSUAL	FIRE AND					Precaution	s to be Taken						
	N HAZARDS	Dust clouds may be ex				in Handling Keep container tigt	tily closed when not in		tore in a dry place awa angerous when wet, ta				tandling.
		dust when damp may h increases. Reacts with				Other Prec	autions Read la	abel on containe	er before using. Do not wear cont y. Not for drug, food or household	act lenses when wor	king with chemics	als.	
		hydrogen. Molten alun also react violently with							strips have sharp edge				
		iron and lead) and nitra ammonium nitrate).							ash contaminated cloti		n mon nati	un gi	
		annonan maacy.				Revision N	No. 12 Dat	e 01/01/	07 Approved	James A.	Bortsch	Chemical Safety	JAB
D.O.T.	Non Regula	ated.					ntained herein is furnist ke independent determ	ed without war	andards. Printed on recycled paper			Coordinator	
Approved by U.		Labor "essentially similar" to form OSHA-	20			health of employee	es. * Hazardous Materia	als industrial Sta	andards. Printed on recycled pape	in. If.	r le essure proper	ass of mean materials	and the safety and

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	MATERIA	AL SAFETY	DATA SHEET	SECTION V HEALTH HAZARD DATA AA0271
Lab Leari	Learning 240 North Third Street - Suite 1 Harrisburg, PA 17101	1300 MSDS No	.: AA0271	Threshold Limited Value As Ammonia gas TWA: 25 ppm; STEL: 35 ppm (ACGIH 2001). Oral Rat-LD50 350 mg/Kg.
	www.LabLearner.com 1.877.LEARN78	Effective [Effects of Overexposure Material is extremely destructive to tissue of the mucous membranes, upper
SECTION I	NAME	24 HOUR EMERC	GENCY ASSISTANCE	respiratory, gastrointestinal and digestive tract, eyes and skin. Inhalation may be fatal as a result of spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Symptoms of
Product Ammonium	Hydroxide, 0.75 Molar Solution			overexposure may include burning sensation, shortness of breath, headache, nausea, vomiting, convulsions and shock. Target organs: Eyes, skin and mucous membranes.
Chemical	Hydroxide, Water Solution		24-9300 Health 1	Emergency and
Formula Mixture.		- 💛 Day 585	5-226-6177 Fire 0	First Aid Procedures INGESTION: Call physician or Poison Control Center immediately. Induce vomitting only if advised by appropriate medical personnel. Never give
Unit Size up to 3.785		- NFPA	Reactivity 1 HMIS *	anything by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thoroughly
		- HAZARD RATING	DERATE SERIOUS SEVERE	with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. <u>SKIN</u> : Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get
C.A.S. No. Mixture.	INGREDIENTS OF		2 3 4	medical attention. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Principal Component(%	TLV Units	SECTION VI REACTIVITY DATA
Ammonium hydroxide:		~ 1.28% as Ammonia		Stability Unstable Conditions to Avoid Excessive temperature.
			25 ppm in air as ammonia	Stable X
Water: (CAS No. 7732 CAUTION!	- 18-5)	~99%	None established.	(Materials to Avoid) Acids, strong oxidizers, halogens, heavy metals.
HARMFUL IF SWALLO	WED, CAUSES IRRITATION.			Hazardous Decomposes to ammonia gas and above 450°C (842°F) to hydrogen
SECTION III	PHYSICAL DATA			Decomposition Products gas and nitrogen oxides.
Melting Point (°F)	Freezes @ 0°C (32°F)	Specific Gravity ($H_2 O = 1$)	~ 1.0	Hazardous Polymerization Conditions to Avoid
Boiling Point (°F)	~ 100°C (212°F)	Percent Volatile by Volume (%)	100%	May Occur Will Not Occur Not applicable.
Vapor Pressure (mm Hg)	14 (water)	Evaporation Rate (Water =1)	>1	SECTION VII SPILL OR LEAK PROCEDURES
Vapor Density (Air=1)	0.7 (water)	(Steps to be taken in case material is released or spilled Wearing protective equipment, carefully neutralize with sodium
Solubility in Water	Complete.			bisulfate. Absorb with Inert dry material and place in suitable
Appearance & Odor	Water, white liquid; strong amm			container for proper disposal.
SECTION IV	FIRE AND EXPLOS			Waste Disposal Method Discharge, treatment, or disposal may be subject to Federal, State or Local laws. These disposal guidelines are intended for the disposal of catalog-size quantities only.
Flash Point (Method Used) N/A	Flammable I % by Volum		Lower Upper	Dispose of in accordance with Federal, State and Local regulations.
Extinguisher Media Use a	any media for extinguishing the supp	orting fire.		SECTION VIII SPECIAL PROTECTION INFORMATION
SPECIAL FIREFIGHTIN			<u>.</u>	Respiration Protection Work in ventilation hood or wear a NIOSH/MSHA-approved respirator with ammonia (Specify Type) canister if necessary.
PROCEDURES				Ventilation Local Exhaust Recommended. Special No.
		ing with respirator mask	havino ammonia vanor	Mechanical (General) Recommended. Other No.
		A-approved self-containe		Protective Gloves Rubber. Eye Protection Chemical safety goggles.
				Other Protective Equipment Faceshield, lab coat, vented hood, proper gloves, eye wash station.
				SECTION IX SPECIAL PRECAUTIONS
UNUSUAL FIRE AND EXPLOSION HAZARDS				Precautions to be Taken in Handling & Storing Store at 75°F. Store away from sources of ignition, separate from acids. Store in a well-ventilated area. Wash thoroughly after handling.
	In fire conditions, water r cause hazardous decom	may evaporate from this : position products to be p		Other Precautions Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.
				Avoid contact with eyes, skin and mucous membranes. Avoid breathing vapor. Use with adequate ventilation. Remove and wash contaminated clothing.
				Revision No. 1 Date 08/25/08 Approved James A. Bertsch Chemical Safety JAB
D.O.T. Non Regulat		20		The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Historicous informations from a supplementation of the safety and health of employees. * Historicous informations from a supplementation of the safety and health of employees. * Historicous informations from a supplementation of the safety and health of employees. * Historicous information from a supplementation of the safety and health of employees. * Historicous information from a supplementation of the safety and health of t
Approved by U.S. Department of	Labor "essentially similar" to form OSHA-2	20		neam or employees. Theoretoous materials moustilal standards, #timeo un recycled paper.

Lah	Learn	A M	-	DATA SHEET	SECTION V Threshold Limited V	HEALTH HAZARD DATA alue As Ammonia gas TWA: 25 ppm; STEL:
	The Science of Lea		1300 MSDS No.	: AA0272		Oral Rat-LD50 350 mg/Kg.
SECTIO	N I .	1.877.LEARN78	Effective D	August 25, 2008		SURE Material is extremely destructive to tissue and digestive tract, eyes and skin. Inhalation m f the larynx and bronchi, chemical pneumonitis a
Product	Ammonium Hy	/droxide, 1.5 Molar Solution	Снем			burning sensation, shortness of breath, headach es, skin and mucous membranes.
Chemical Synonyms	Ammonium Hy	droxide, Water Solution		4-9300 Health 1	Emergency and	
Formula	Mixture.		-	-226-6177 Fire 0 Reactivity 1	First Aid Procedures	vomuing only in advised by appropriate in
Unit Size	up to 3.785 Lt.		HAZARD BATING	HMIS *	anything by mouth to an u with water for at least 15 p	nconscious person. <u>EYES:</u> Check for and remove ninutes, lifting upper and lower eyelids occasiona
C.A.S. No.	Mixture.		 MINIMAL SLIGHT MOI 	2 3 4	SKIN: Remove contamina	ated clothing. Flush thoroughly with mild soap an ATION: Remove to fresh air. If not breathing, give
SECTIO		INGREDIENTS OF			difficult, give oxygen. Get	medical attention.
Principal C	Component(s)		%	TLV Units	SECTION VI	REACTIVITY DATA
Ammoni	um hydroxide: (C	AS No. 1336-21-6)	~ 2.55% as Ammonia	25 ppm in air as ammonia	Stability Unstable Stable	Conditions to Avoid X
Water: (CAS No. 7732-1	8-5)	~99%	None established.	Incompatibility	
CAUTIO	NI				(Materials to Avoid)	Acids, strong oxidizers, halogens, heavy me
HARMFU		ED. CAUSES IRRITATION. PHYSICAL DATA			Hazardous Decomposition Prod	Decomposes to ammonia gas an gas and nitrogen oxides.
Melting Poir	1	Freezes @ 0°C (32°F)	Specific Gravity (H ₂ O = 1)	~ 1.0	Hazardous Polymerizat	
Boiling Poin	t (°F)	~ 100°C (212°F)	Percent Volatile by Volume (%)	100%	May Occur Will No	Not Not
Vapor Press	sure (mm Hg)	14 (water)	Evaporation Rate (Water =1)	>1	SECTION VII	SPILL OR LEAK PROCEDU
Vapor Dens	ity (Air=1)	0.7 (water)	(water =1)	L	Steps to be taken in	
Solubility in	Water	Complete.		,	material is released of	bisulfate. Absorb with inert of
Appearance	e & Odor	Water, white liquid; strong amn	nonia odor.			container for proper disposal
SECTIO	N IV	FIRE AND EXPLO	SION HAZARD D	АТА	Waste Disposal Meth	Discharge, treatment, or disposal may be subject These disposal guidelines are intended for the d
Flash Point (Method Used)	N/A	Fiammable % by Volun		Lower Upper		Dispose of in accordance with Federal, S
Extinguisher Media	Use any	y media for extinguishing the supp	porting fire.	•	SECTION VIII	SPECIAL PROTECTION IN
SPECIAL F	I IREFIGHTING					ork in ventilation hood or wear a NIOSH/MSHA-a Inister if necessary.
PROCEDUI					Ventilation Local Ext	al (General) Recommended. Special Recommended. Other
			hing with respirator mask		Protective Gloves	Rubber, Eye Protect
		canister, or NIUSH/MSF	A-approved self-containe	eo preatning apparatus.	Other Protective	hield, lab coat, vented hood, proper gloves, eye
					Equipment Faces	
UNUSUAL	FIRE AND	· · · · · · · · · · · · · · · · · · ·		, <u></u> ,,	Precautions to be Taken	Store at 75°F. Store away from sources
EXPLOSIO	N HAZARDS				in Handling & Storing Keep container tightly closed when not in t	
			may evaporate from this		Other Precautions Read is	teel on container before using. Do not wear contact lenses when working oratory use only. Not for drug, food or household use. Keep out of react
		cause nazardous decon	position products to be p	roduced as tume.		d contact with eyes, skin and mucous membrane
					adec	uate ventilation. Remove and wash contaminate
					Revision No. 1 Dat	uate ventilation. Remove and wash contaminate e 08/25/08 Approved James A. Bri ted without warranty of any kind. Employers should use this information inform of sufficiences of information from all sources to

Effects -4	0	-		ral Rat-LD50 350 mg		•				
Effects of		<u> </u>		aterial is extremely o stive tract, eyes and						
				x and bronchi, chemi						
				ensation, shortness o		ache, naus	sea, vomiting, con	vulsions and		
_	-	-	yes, skin ar	id mucous membran	es.					
Emergen				GESTION: Call phy	vsician or Poiso	n Control	Center immediate	lv. Induce		
First Aid			vo	omiting only if advise	d by appropriat	e medical	personnel. Never	give		
with water <u>SKIN:</u> Rei	for at move	least 15 contamii	minutes, lift nated clothir	s person. <u>EYES:</u> Cl ing upper and lower ng. Flush thoroughly emove to fresh air. I	eyelids occasio with mild soap	natiy. Ge and water	t immediate medic r. If irritation occu	al attention.		
			t medical at		n not preatring,	give arm	cial respiration. If	breatting is		
SECTIC	N V	1	R	EACTIVITY D		· .				
Stability	Un	stable		Conditions to	Avoid	voorahvo tr	emperature.			
	St	able	Х				silperature.			
Incompat	ibilit	ty	A state							
(Materials	s to A	Avoid)	Acids,	strong oxidizers, ha	logens, heavy r	netals.				
Hazardou	IS			Decomposes	to ammonia de	s and abov	ve 450°C (842°F)	to hydrogen		
Decompo		on Proe	ducts	gas and nitrog		5 and 2001		io nyurugen		
Hazardous		vmeriza	tion	Conditions to	Avoid					
May Occu			ot Occur			lot applica	ible.			
				Not applicable.						
			x							
SECTIO	N V		×			DURES				
SECTIC		11	S	PILL OR LEA		DURES		· .		
Steps to I	be ta	li ken in	S case		K PROCEI			h sodium		
Steps to I	be ta	li ken in	S case	d Wearing p bisulfate.	KPROCE	nent, care rt dry mate		h sodium suitable		
Steps to I	be ta	li ken in	S case	d Wearing p bisulfate.	K PROCE	nent, care rt dry mate	fully neutralize wit	h sodium suitable		
Steps to I material i	be ta s rel	ll ken in eased	case or spille	d Wearing p bisulfate. container f	KPROCES rotective equipr Absorb with ine for proper dispo	nent, care rt dry mate sal. biect to Fed	fully neutralize wit erial and place in s eral. State or Local la	suitable		
Steps to I	be ta s rel	ll ken in eased	case or spille	d Wearing p bisulfate. container f	KPROCES rotective equipr Absorb with ine for proper dispo	nent, care rt dry mate sal. biect to Fed	fully neutralize wit erial and place in s eral. State or Local la	suitable		
Steps to I material i	be ta s rel	ll ken in eased	case or spille hod Dis	d Wearing p bisulfate. container f	KPROCED rotective equipr Absorb with ine or proper dispo sposal may be suit are intended for th	nent, care rt dry mate sal. bject to Fed le disposal o	fully neutralize wit erial and place in s eral, State or Local la of catalog-size quant	suitable aws. ities only.		
Steps to I material i Waste Dis	be ta s rel spos	il iken in eased al Met	case or spille hod Dis The Di	d Wearing p bisulfate container f charge, treatment, or di ese disposal guidelines spose of in accordar	KPROCED rotective equipr Absorb with ine or proper dispo sposal may be suit are intended for th nce with Federa	nent, care rt dry mate sal. bject to Fed le disposal d I, State an	fully neutralize wit erial and place in s eral, State or Local la of catalog-size quant d Local regulation	suitable aws. ities only.		
Steps to I material i Waste Dis	be ta s rel spos	il Iken in eased cal Met	case or spille hod Dis Dis S	d Wearing p bisulfate. container f charge, treatment, or di ase disposal guidelines spose of in accordar PECIAL PRO	KPROCED rotective equipr Absorb with ine for proper dispo sposal may be suit are intended for the nce with Federa TECTIONI	nent, care rt dry mate isal. bject to Fed le disposal d I, State an	fully neutralize wit erial and place in s eral, State or Local la of catalog-size quanti id Local regulation	suitable aws, tites only. S.		
Steps to I material i Waste Dis	be ta s rel spos	il iken in eased cal Met	case or spille hod Dis Dis S	d Wearing p bisulfate, container f charge, treatment, or di ese disposal guidelines spose of in accordan PECIAL PROT illation hood or wear	KPROCED rotective equipr Absorb with ine for proper dispo sposal may be suit are intended for the nce with Federa TECTIONI	nent, care rt dry mate isal. bject to Fed le disposal d I, State an	fully neutralize wit erial and place in s eral, State or Local la of catalog-size quanti id Local regulation	suitable aws, tites only. S.		
Steps to I material i Waste Dia SECTIO Respiration P (Specify Type)	be ta s rel spos	il iken in eased cal Met	hod Dist brok in veni case or spille	d Wearing p bisulfate, container f charge, treatment, or di ese disposal guidelines spose of in accordan PECIAL PROT illation hood or wear	KPROCED rotective equipr Absorb with ine or proper dispo sposal may be sut are intended for th nce with Federa TECTIONII a NIOSH/MSH,	nent, care rt dry mate isal. bject to Fed le disposal d I, State an	fully neutralize wit erial and place in s eral, State or Local la of catalog-size quant id Local regulation MATION id respirator with a No.	suitable aws, tites only. S.		
Steps to I material i Waste Dis SECTIO Respiration P	be ta s rel spos	il iken in eased cal Met	hod Dist brok in veni case or spille	d Wearing p bisulfate. container f charge, treatment, or di ase disposal guidelines spose of in accordan PECIAL PRO illation hood or wear accessary. Recommende	KPROCES rotective equipr Absorb with ine or proper dispo sposal may be sui are intended for th nce with Federa IECTIONII a NIOSH/MSH, ad. Special d. Other	nent, care rt dry mate sal. bject to Fed le disposal d I, State an NEORI A-approve	fully neutralize wit erial and place in s eral, State or Local la of catalog-size quant d Local regulation MATION d respirator with a	suitable aws, tites only. S.		
Steps to I material i Waste Dia SECTIO Respiration P (Specify Type)	be ta s rel spos	iken in eased cal Met	hod Dist hod Dist bod Dist Dist Dist Dist Dist Dist Dist Dist	d Wearing p bisulfate. container f charge, treatment, or di ase disposal guidelines spose of in accordan PECIAL PRO illation hood or wear accessary. Recommende	KPROCES rotective equipr Absorb with ine for proper dispo sposal may be sui are intended for th nce with Federa IECTIONII a NIOSH/MSH, ad. Special	nent, care rt dry mate sal. bject to Fed le disposal d I, State an NEORI A-approve	fully neutralize wit erial and place in s eral, State or Local la of catalog-size quant id Local regulation MATION id respirator with a No.	suitable aws. ties only. s. ammonía		
Steps to I material i Waste Dis SECTIC Respiration P (Specify Type) Ventilatio Protective Other Protecti	on V	il iken in eased al Met ion (Local E Mechani OVes	hod Dis hod Dis The Dis Nork in veni canister if ne chaust	d Wearing p bisulfate, container f charge, treatment, or di ese disposal guidelines spose of in accordar PECIAL PRO PECIAL PRO PECIA	K PROCES rotective equipr Absorb with ine for proper dispo sposal may be suit are intended for the are with Federa TECTIONI a NIOSH/MSH, ad. Special ad. Other Eye Prote	nent, care rt dry mate sal. bject to Fed e disposal d I, State an NEORI A-approve	fully neutralize wit erial and place in s of catalog-size quanti id Local regulation MATION id respirator with a No. No. Chemical saf	suitable aws. ties only. s. ammonía		
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Steps to I material i Waste Dis SECTIC Respiration P (Specify Type) Ventilatio Protective Other Protecti	DN V rotection e Gio	ii kken in eased cal Met ion () Local Ex Mechani DVes Face	hod District of the shield, lab (d Wearing p bisulfate, container f charge, treatment, or di ese disposal guidelines spose of in accordar PECIAL PRO PECIAL PRO PECIA	KPROCES rotective equipr Absorb with ine or proper dispo sposal may be suit are intended for th nce with Federa ECTIONI a NIOSH/MSH, ad. Special ad. Other Eye Prote roper gloves, ey	nent, care rt dry mate sal. bject to Fed e disposal of I, State an NEORI A-approve ection	fully neutralize wit erial and place in s of catalog-size quanti id Local regulation MATION id respirator with a No. No. Chemical saf	suitable aws. ties only. s. ammonía		
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Steps to I material i Waste Dia SECTIO Respiration P Respiration P Ventilatio Protective Other Protective Other Protective SECTIO Precautions	DN V rotect	iii ken in eased al Met iai Met ion d Local E Mechan OVES Face Face Coring	hod Dis hod Dis The Dis The Dis Nork in veni canister if ne chaust ical (General cal (General cal (General cal (General cal (General	d Wearing p bisulfate. container f charge, treatment, or di ase disposal guidelines spose of in accordar PECIAL PRO illation hood or wear accessary. Recommende Rubber. coat, vented hood, p	KPROCEI rotective equipr Absorb with ine for proper dispo sposal may be suitare intended for the ace with Federa TECTIONI a NIOSH/MSH/ ad. Special d. Other Eye Prote roper gloves, ep AUTIONS	nent, care rt dry mate sal. bject to Fed le disposal of l, State an NEORI A-approve ection ye wash si	fully neutralize wit eral, State or Local la of catalog-size quanti ad Local regulation MATION d respirator with a No. No. Chemical saft tation.	suitable ws. ties only. is. ummonia fety goggles.		
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Steps to I material i Waste Dis SECTIO Respiration P (Specify Type) Ventilatio Protective Other Protecti Equipment SECTIO Precautions in Handling Keep container tgr	be ta srel spos pos ve ve ve ve ve ve ve ve ve ve ve ve ve	il ikken in eased al Met ion \ Local E Mechani OVES Face Coring d when not li ns Read	A case or spille hod Dist Dist Dist Dist Case Nork in vent canister if ne chaust ical (General cashield, lab of shield, lab of shield, lab of shield, lab of shield, lab of shield, lab of	Wearing p bisulfate. container f charge, treatment, or di ase disposal guidelines spose of in accordan PECIAL PROD illation hood or wear cessary. <u>Recommende</u> Rubber. coat, vented hood, p PECIAL PREC tore at 75°F. Store a tore in a well-ventilat	KPROCED rotective equipr Absorb with ine for proper dispo- sposal may be suit are intended for the ace with Federa TECTIONIC a NIOSH/MSH/ a NIOSH/ a NIOSH/MSH/ a NIOSH/MSH/ a NIOSH/ a NIOSH/	nent, care rt dry mate sal. bject to Fed le disposal of l, State an NEORI A-approve ection ye wash si cess of igni a thorough wing with chare each of childre anes. Avo	fully neutralize wit eral and place in s eral, State or Local la of catalog-size quanti ad Local regulation MATION MATION MO. Chemical saft tation. Unical saft tation, separate from ly after handling. n.	suitable ws. tiles only. is. ummonia iety goggles. n acids.		
Steps to I material i Waste Dis SECTIO Respiration P (Specify Type) Ventilatio Protective Other Protection Respiration Protective SECTIO Precautions in Handling Keep container ligt	be ta srel spos pos ve ve ve ve ve ve ve ve ve ve ve ve ve	il ikken in eased al Met ion \ Local E Mechani OVES Face Coring d when not li ns Read	A case or spille bod Dis Dis Dis Dis Dis Dis Dis Case of the case	Wearing p bisulfate. container f charge, treatment, or di ase disposal guidelines spose of in accordan PECIAL PROD illation hood or wear cessary. Recommende Rubber. coat, vented hood, p PECIAL PRED tore at 75°F. Store at tore in a well-ventilat r before using. Do not wear of Not for drug, food or housen vith eyes, skin and m lation. Remove and	KPROCED rotective equipr Absorb with ine for proper dispo- sposal may be suit are intended for the ace with Federa TECTIONIC a NIOSH/MSH/ a NIOSH/ a NIOSH/MSH/ a NIOSH/MSH/ a NIOSH/ a NIOSH/	nent, care rt dry mate sal. bject to Fed le disposal of l, State an NEORI A-approve ection ye wash st ces of igni a thorough wing with cher each of childre anes. Avoi ated cloth	fully neutralize wit eral and place in s eral, State or Local la of catalog-size quanti ad Local regulation MATION MATION MO. Chemical saft tation. Unical saft tation, separate from ly after handling. n.	suitable ws. tiles only. is. ummonia iety goggles. n acids.		

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		MATERIA	L SAFETY	DATA SHEET	SECTION V HEALTH HAZARD DATA AA0274
COMPANY AND DESC	earne Science of Learning	240 North Third Street - Suite 1300 Harrisburg, PA 17101	MSDS No.		Threshold Limited Value As Ammonia gas TWA: 25 ppm; STEL: 35 ppm (ACGIH 2001). Orai Rat-LD50 350 mg/Kg.
		www.LabLearner.com 1.877.LEARN78	Effective D	ate: January 1, 2007	Effects of Overexposure May cause severe irritation or burns to eyes, skin and mucous membrar
SECTIO	NI	NAME	24 HOUR EMERC	SENCY ASSISTANCE	highly toxic by oral and inhalation routes. Inhalation of ammonia gas causes edema, spasm and asphyxia. cap slowly with adequate ventilation; a sudden release of ammonia fumes may cause irritation to eyes and
Product	Ammonium H	fydroxide, 3M (3N)	CHEM		mucous membranes. Target organs: Eyes, skin and mucous membranes.
Chemical Synonyms	Ammonium H	Hydroxide, Water Solution		-226-6177 Fire 0	Emergency and First Aid Procedures INGESTION: Call physician or Poison Control Center immediately. Ind
Formula	Mixture.		NFPA	Reactivity 1	vomiting only if advised by appropriate medical personnel. Never give
Unit Size	up to 3.785 L	t.	HAZARD RATING	HMIS *	anything by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thorou with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical atte
C.A.S. No.	Mixture.			DERATE SERIOUS SEVERE 2 3 4	SKIN: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention. <u>INHALATION:</u> Remove to fresh air. If not breathing, give artificial respiration. If breath
SECTIO		INGREDIENTS OF N			difficult, give oxygen. Get medical attention.
Principal C	Component(s	\$)	%	TLV Units	SECTION VI REACTIVITY DATA
Ammoniu	um hydroxide: (CAS No. 1336-21-6)	~ 5% as Ammonia	25 ppm in air as ammonia	Stability Stable X Excessive temperature.
Water: (CAS No. 7732-	18-5)	~95%	None established.	Incompatibility (Natorials to Avoid) Acids, strong oxidizers, halogens, heavy metals.
WARNIN	IG! CORROSIN	/E!			(Materials to Avoid) Acids, strong oxidizers, halogens, heavy metals.
		ED OR INHALED. CAUSES BURNS			Hazardous Decomposes to ammonia gas and above 450°C (842°F) to hydr Decomposition Products gas and nitrogen oxides.
SECTIO		PHYSICAL DATA			Hazardous Polymerization Conditions to Avoid
Melting Poin	. ,		Specific Gravity (H ₂ O = 1) Percent Volatile	~ 1.0	May Occur Will Not Occur Not applicable.
Boiling Point	<u> </u>	~ 100°C (212°F)	by Volume (%) Evaporation Rate	100%	
· · · · · · · · · · · · · · · · · · ·	sure (mm Hg)	14 (water)	(Water =1)	>1	SECTION VII SPILL OR LEAK PROCEDURES Steps to be taken in case
Vapor Densi		0.7 (water)			wearing protective equipment, carefully neutralize with social
Solubility in '		Complete.	·		bisulfate. Absorb with inert dry material and place in suitable container for proper disposal.
Appearance SECTIO		Water, white liquid: strong ammo		AT 5	Waste Disposal Method Discharge, treatment, or disposal may be subject to Federal, State or Local laws.
Flash Point		FIRE AND EXPLOS		Lower Upper	Waste Disposal Method Discharge, treatment, or disposal may be subject to Federal, State or Local laws. These disposal guidelines are intended for the disposal of catalog-size quantities only
(Method Used)	N/A	% by Volume	N/A		Dispose of in accordance with Federal, State and Local regulations.
Extinguisher Media	Use a	ny media for extinguishing the support	ting fire.		SECTION VIII SPECIAL PROTECTION INFORMATION
	I IREFIGHTING			· · · · · · · · · · · · · · · · · · ·	Respiration Protection Work in ventilation hood or wear a NIOSH/MSHA-approved respirator with ammon (Specify Type) canister if necessary.
PROCEDUR					Ventilation Local Exhaust Recommended. Special No.
		Wear full protective clothin			Mechanical (General) Recommended. Other No.
		canister, or NIOSH/MSHA	-approved self-containe	ed breathing apparatus.	Other Protective
					Equipment Faceshield, lab coat, vented hood, proper gloves, eye wash station. SECTION IX SPECIAL PRECAUTIONS
					Precautions to be Taken
UNUSUAL I EXPLOSIOI	N HAZARDS				in Handling & Storing Keep container tightly closed when not in use. Store at 75°F. Store away from sources of ignition, separate from acids Store in a well-ventilated area. Wash thoroughly after handling.
		J Vapors formed from this p	oduct are heavier than	air and may travel	Other Precautions Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, focd or household use. Keep out of reach of children.
		along the ground to a dista irritating, corrosive and/or		Fire may produce	
		initiating, contosive anu/or	toxio futfica.		Avoid contact with eyes, skin and mucous membranes. Avoid breathing vapor. Use adequate ventilation. Remove and wash contaminated clothing.
					Revision No. 2 Date 01/01/07 Approved James A. Bertsch Coordinator JA

		MATERIA	AL SA	FETY	DATA SHEET	SECTIO	N V - space	H	EALTH HAZARD DA	ТА	AA0425
Labl	earne	Cognitive Learning Systems				Threshold	Limited Va		None established by ACGIH 20)1.	
m	he Science of Learn	 Harnsburg, PA 17105 www.LabLeamer.com 		MSDS No.		Effecte of	<u>Overevnee</u>				
SECTIC	NAL 1	1.877.LEARN78			Pate: January 1, 2007	Ellects of	Overexpos		May be a mild eye, skin or respi	ratory irritant. M	lav cause
Product		NAME	24 HOU	REMERC	SENCY ASSISTANCE			5	gastrointestinal irritation. Exerci minimize potential hazards. Tai	se appropriate j	procedures to
Chemical	L+Ascorbic	Acid	-		TREC Health 1					gerorgana. Dio	
Synonyms	Vitamin C		- 🔨		-226-6177 Fire 1	Emergeno			INGESTION: Call physician or	Poison Control	Center immediately. Induce
Formula	C ₆ H ₈ O ₆		_ NFF	ΡA	Reactivity 0		Procedures		vomiting only if advised by appr person. EYES: Check for and	opriate medical	personnel. Never give lenses. Elush thoroughly
Unit Size	up to 2.5 K	g.	- MINIMAL	D RATING SLIGHT MOI		with water for	at least 15 min	utes, liftin	g upper and lower eyelids occa J. Flush thoroughly with mild so	sionally. Get im	mediate medical attention.
C.A.S. No.	50-81-7	INGREDIENTS OF			2 3 4	medical atten	tion. INHALAT	ION: Rei	move to fresh air. If not breathi		
· ·	Component			%	TLV Units	SECTIO	oxygen. Get m N VI				
	corbic acid			100%	None established.	Stability	Unstable		Conditions to Avoid	(Promotes oxid	dation.) Moisture, light especially
		······································		100 %			Stable	Х		if in aqueous s	olution.
		CAUSE IRRITATION.				Incompati (Materials		Alkal	is, iron, copper, water, oxidizing	agents, acids.	
	UTION: MAT	CAUSE IRRITATION.				Hazardou	······	•••••	Combusting will produce		
SECTIO	N III	PHYSICAL DATA					sition Prod	ucts	Combustion will produce monoxide.	caroon cloxide a	ind probably carbon
Melting Poir		190-192°C (374-377°F)	Specific Gravity	(H ₂ O = 1)	1.65		Polymerizati		Conditions to Avoid		
Boiling Poin	nt (°F)	Decomposes.	Percent Volatile by Volume (%)	9	Negligible as solid.	May Occu	r Will No X	t Occur	4	Not appli	cable.
Vapor Pres	sure (mm Hg)	Negligible as solid.	Evaporation Ra	ite	Not applicable.	SECTIO			PILL OR LEAK PRO	CEDURES	
Vapor Dens	sity (Air=1)	Unknown.	(-1)		1		e taken in o				
Solubility in	Water	30% by weight at 20°C.			1	material is	s released o	or spille	Sweep up spilled ma disposal. Wash spil		in a suitable container for
Appearance	e & Odor	White to slightly off-white granular	powder or c	rystals. Nea	rly odoriess.					· · ·	
SECTIO	NIV 👘	FIRE AND EXPLOS		ZARD D		Waste Dis	posal Meth	od Di	scharge, treatment, or disposal may ese disposal guidelines are intended	e subject to Fede for the disposal of	al, State or Local laws.
Flash Point (Method Used)) Non-flamr	nable. Flammable i % by Volum		J. ft.)	Lower Upper 10 20			Di	spose of in accordance with fee	ieral, state and I	ocal regulations.
Extinguisher	llee anv n	nedia suitable for extinguishing supp	orting fire				NT 37111		-		-
Media	Use any n		orang me.			SECTIO Respiration Pr	otection No	one shoul	PECIAL PROTECTIO	y handling. If d	usty conditions prevail work in
SPECIAL F	REFIGHTIN	G				(Specify Type)	Vê	ntilation h	lood or wear NIOSH/MSHA-app Recommended. Spe	roved dust mas	k. No.
		I In fire conditions, wea	ar a NIOSH/I	VISHA-annro	ved self-contained	Ventilation	Mechanic	al (General	I) Recommended. Oth	er	No.
		breathing apparatus				Protective		Rubber, if	sensitive to irritation. Eye P	rotection	Chemical safety glasses.
						Other Protectly Equipment	Safet		s, lab coat or apron, eye wash s		oves.
		1				SECTIO	N IX to be Taken	S	PECIAL PRECAUTIC	NS	g trê de se provinción d'a seri
UNUSUAL	FIRE AND					in Handling	& Storing		eep container tightly closed, in		
		Fire or excessive heat products; can react v					ly closed when not in u		elow 33°C (72°F). Keep away		
		fire hazard when exp	osed to heat			Other Preca	utions For labo	oel on contain tratory use on	er before using. Do not wear contact lenses w y. Not for drug, food or household use. Keep	ten working with chemi out of reach of children.)alş.
		may ignite or explode Auto-ignition tempera		(1220°F).			Prote	ct from ex	posure and light. Remove and	wash contamin	ated clothing.
						<u> </u>					Chamical Cafab
D.O.T.	NON-REGUL	ATED.				Revision No The Information cont		ed without war	/07 Approved Jame ranty of any kind. Employers should use this i ability and completeness of information from all	s A. Bertsch formation only as a su	Chemical Safety Coordinator JAB oplement to other Information gathered by
		f Labor "essentially similar" to form OSHA-	20			them and must make health of employees.	e independent determit . * Hazardous Materia	nations of suita Is industrial St	ability and completeness of information from all andards. Printed on recycled paper.	sources to assure prop	aruse of these materials and the satety and

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推 数 彩		MATE	RIAL SA	FETY	DATA SHEET	SECTION V HEALTH HAZARD DATA CC0055
Lablea	irne	Cognitive Learning Systems 240 North Third Street - Suite 1300				TWA: 10 mg/m ³ ACGIH 1992-93.
The Science	e of Learnin	 9 240 North Third Street - Suite 1300 9 Herrisburg, PA 17101 www.LabLearner.com 		MSDS No		
		1.877.LEARN78		Effective [Date: January 1, 2007	Effects of Overexposure Inhatation of respirable dusts may aggravate respiratory tract.
SECTION I		NAME	24 HOU	REMERO	GENCY ASSISTANCE	Exposure to dust may irritate skin and eyes. Ingestion should not
Product Ca	alcium Ca	arbonate, Powder			Health 1	cause any health problems. Target organs: None known.
Chemical Synonyms Lir	imestone;	Precipitated Calcium Carbon	ate		24-9300 Health 1 5-226-6177 Fire 0	Emergency and
Formula Ca	aCO3			y ,	Reactivity 0	First Aid Procedures INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give
	p to 2.5 K	g	NFP	A DRATING	HMIS *	anything by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.
C.A.S. No. 13	317-65-3		MINIMAL O	SLIGHT MO	DERATE SERIOUS SEVERE	SKIN: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is
SECTION II		INGREDIENTS	OF MIXTUR	ES		difficult, give oxygen. Get medical attention.
Principal Comp	onent(s	3)		%	TLV Units	SECTION VI REACTIVITY DATA
Calcium Carbona	ate			>97%	See Section V.	Stability Unstable Conditions to Avoid Stable X Not applicable.
						incompatibility
CAUTION! MAY	Y CAUSE	IRRITATION TO SKIN,			· · · · · · · · · · · · · · · · · · ·	(Materials to Avoid) Will react with acids.
EYES AND RES	SPIRATO	RY TRACT.				Hazardous Reacts with acids to produce CO _a .
SECTION III		PHYSICAL DA	ТА	1		
Melting Point (°F)		Decomposes 825°C (1517°F		$(H_{2}O = 1)$	2.7	Hazardous Polymerization Conditions to Avoid May Occur Will Not Occur
Boiling Point (°F)		N/A	Percent Volatile by Volume (%)		N/A	Not applicable.
Vapor Pressure (n	mm Hg)	N/A	Evaporation Ra	le	N/A	SECTION VII SPILL OR LEAK PROCEDURES
Vapor Density (Air	ir=1)	N/A			-!	Steps to be taken in case Care should be taken to avoid causing dust to become airborne.
Solubility in Water	r	0.0014 g/100 mL.				material is released or spilled Sweep or vacuum up and place in a suitable container for disposal. Vacuum cleaning systems are recommended. Wash
Appearance & Od	lor	White powder; odorless.				spill area with soap and water.
SECTION IV		FIRE AND EXF	PLOSION HA	ZARD D		Waste Disposal Method Discharge, treatment, or disposal may be subject to Federal, State or Local laws. These disposal guidelines are intended for the disposal of catalog-size quantities only.
Flash Point (Method Used)	Non-flam		mable Limits in Air Volume	1/A -	Lower Upper	Uncontaminated material may be disposed of in a sanitary landfill.
Extinguisher						· · ·
Media	Use any	media suitable for extinguishi	ing supporting fire.			SECTION VIII SPECIAL PROTECTION INFORMATION Respiration Protection None should be needed in normal laboratory handling. If dusty conditions prevail,
SPECIAL FIREFI	IGHTING	à				(Specify Type) work in a ventilation nood or wear a NIOSH/MSHA-approved cust mask.
PROCEDURES						Ventilation Local Exhaust Recommended. Special No. Mechanical (General) Recommended. Other No.
			ns, wear a NIOSH/ aratus and full prot		oved, self-contained	Protective Gloves Rubber. Eye Protection Chemical safety glasses.
		breating app	aratus and fun prof	SCIIVE CIOUSI	iig.	Other Protective Equipment Goggles, smock, apron, proper gloves, and eye wash station.
						SECTION IX SPECIAL PRECAUTIONS
UNUSUAL FIRE	AND					Precautions to be Taken in Handling & Storing Store in a cool, dry place away from acids. Product becomes
EXPLOSION HAZ						in Handling & Storing Store in a cool, dry place away from acids. Product becomes slippery when moistened. Wash thoroughly after handling.
		— The fumes eve	olved by burning ca	licium carbo	nate in air are	Other Precautions Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.
			Calcium Oxide (qui skin, eyes, and m			Do not breathe dust.
		in adding to the	and oyou, and m			Remove and wash contaminated clothing.
						Revision No. 7 Date 01/01/07 Approved James A. Berlsch Chemical Safety JAB
D.O.T.	NON-R	EGULATED.				Revision No. 7 Date 01/01/07 Approved James A. Bertsch Condition JAB The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinishors of suitability and completeness of information from all sources to assure propervise of these materials and the safety and
	and the second	Labor "essentially similar" to form (OSHA-20			inem and must make independent determinations or suitability and boingleteness or information an sources to assure properties of inese materials and the salety and health of employees. * Hazardous Materials Industrial Standards. Printed on recycled paper.

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I nhi	anrna			AL SAF	ETY	DATA	SHEET	SECTION Threshold		ted V:
	earne	9 Harrisburg, PA 17101	e 1300	ĸ	ASDS No.:	: CC006	30	Inteactord		
		www.LabLearner.com 1.877.LEARN78			Effective D		ry 1, 2007	Effects of	Overe	expos
SECTIO	N I	NAME		24 HOUR	EMERG	ENCY AS	SISTANCE			
Product	Calcium Cart	onate, Chips			CHEM.		alth 0			
Chemical Synonyms	Marble Chips	, Boiling Chips			> 800-42 Day 585	4-9300 Fir		Emergenc		
Formula	CaCO3					Re	activity 0	First Aid P		
Unit Size	up to 12 Kg.			HAZARD F		<u> </u>	HMIS*	anything by with water fo	or at lea	ast 15 r
C.A.S. No.	471-34-1			- MINIMAL S	LIGHT MOD	ERATE SERIO	US SEVERE 4	SKIN: Rem medical atte		
SECTIO		INGREDIE	NTS OF	MIXTURE	_	т. н. н. т		difficult, give		n. Gel
Principal C	Component(s	\$)			%	TLV	Units	SECTIO	V VI. Unsta	abla
Calcium	Carbonate, Chi	ps			>99%	See	Section V.	Stability	Stab	
								Incompatil	bility	
CAUTIO	N! USE EXTR	EME CARE IN THE U	SE OF MARB	LE CHIPS IN (GENERAT	ING CO ₂ .		(Materials		/0id)
								Hazardous		Prod
SECTIO		PHYSICA						Hazardous		
Melting Poir	<u>, ,</u>	Decomposes 826°C	(1520°F)	Specific Gravity (F Percent Volatile	$I_2 O = 1$	2.85		May Occur		Will No
Boiling Poin		N/A		by Volume (%) Evaporation Rate		N/A				
	sure (mm Hg)	N/A		(Butyl acetate	=1)	N/A		SECTION Steps to be		
Vapor Dens		N/A						material is		
Solubility in		0.001% @ 0°C; 0.00),						
Appearance SECTIO		White stone chips; r				ለተለ		Waste Dis	nocal	Meti
SECTIO Flash Point (Method Used)		ammable.	Flammable L % by Volum	imits in Air		Lower	Upper	Waste Dis	<u>JU5ai</u>	INCL
Extinguisher		u nadio avitable for a						SECTION		
Media	IREFIGHTIN	ny media suitable for e	xtinguisning s	upporting fire.				Respiration Pro (Specify Type)		_
PROCEDUI								Ventilation		ocal Ex
				ar a NIOSH/MS ing apparatus a				Protective		lechanio res
		clothing		ing apparatus c	and hun pro	necave		Other Protective		G
								Equipment SECTIO	N LY	
UNUSUAL							·····	Precautions	to be "	
	N HAZARDS							in Handling & Keep container tightly		Ŧ
		 The furr	es evolved by	y burning calciu	um carbon	ate in air is		Other Precau		Read
		compos	ed of calcium	oxide (quick lin mucous memb	me). This		tating			For lac
			in, eyes, anu		nanca.					Do n may
								Revision No). 7	Dat
D.O.T.	NON-REGU	LATED.						The information conta	ained here!	in is turnis
Approved by U.	S. Department of	Labor "essentially similar"	to form OSHA-2	20				them and must make health of employees.	* Hazardo	ous Materl

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SECTION V	/ * : *	HE	ALTH HAZAF	RD DA	TA	CC0060				
Threshold Li	mited V	/alue Cal	lcium carbonate, pov	vder: TW/	\: 10 mg/m ³ /	ACGIH, 2001.				
Effects of Ov	erexpo	LOV trac cau	ow hazard as chips. Inhalation of respirable dusts may aggravate respiratory acts. Exposure to dust may irritate skin and eyes. Ingestion should not ause any health problems. Exercise appropriate procedures to minimize otential hazards. Target rorgans: None known.							
with water for a <u>SKIN:</u> Remove medical attentio difficult, give ox	cedure with to an i t least 15 e contamir on. <u>INHAJ</u> tygen. Ge	vor unconscious minutes, liftir nated clothing LATION: Re et medical atte	miting only if advised person. <u>EYES:</u> Chang upper and lower end g. Flush thoroughly we move to fresh air. If ention.	by appro eck for an yelids occ with mild s not breat	priate medical d remove con casionally. Ge soap and wate	Center immediately. Induce I personnel. Never give tact lenses. Flush thoroughly t immediate medical attention. er. If irritation occurs, get icial respiration. If breathing is				
SECTION	nstable		ACTIVITY DA Conditions to A		·					
Stadility 🗀	istable	x		woiu	Acids.					
Incompatibil (Materials to	ity	AADL	act with acids.		·····					
Hazardous Decompositi	on Proc	ducts	Reacts with acids to produce carbon dioxide.							
lazardous Po	lymeriza	ition	Conditions to Avoid							
May Occur	Will N	ot Occur	Not applicable.							
material is re	Heased	or spilled		oid causin		per disposal. Care should be me airborne. Wash spill area				
Waste Dispo	sal Met	The	se disposal guidelines a	re intended	for the disposal	deral, State or Local laws. of catalog-size quantities only.				
	71113		pose of in accordanc		-	-				
SECTION Respiration Protect Specify Type)	tion h	None should	DECIAL PROT be needed in normal tilation hood or wear	l laborator a NIOSH	y handling. If /MSHA-appro	dusty conditions prevail,				
/entilation	Local E		Recommended			No.				
Protective G		ical (General) Leathe	Recommended er or rubber.		rotection	No. Chemical safety glasses.				
Other Protective	(Goggles, lab	coat, proper gloves,	proper ve	ntilation if dus					
SECTION I	X	SF	PECIAL PREC	AUTIC	NS	and the second				
Precautions to n Handling & S Keep container tightly close	Storing	Sto	ore in a dry place aw ash thoroughly after I		cids.	····				
Other Precautio	ons Read For la	label on container iboratory use only.	before using. Do not wear con Not for drug, food or househo	ntact lenses wi Id use. Keep	hen working with che out of reach of childre	micals. en.				
			to marble chips in a nove and wash conta			erous explosion				
Revision No.	7 Da	ate 01/01/	07 Approved	.lam	es A. Bertsch	Chemical Safety Coordinator JAB				
The information contained	Liberale is there		or proproved							

shed without warranty of any kind. Employees should use this information only as a supplement to other information gathered by nitriations of suitability and completeness of information from all sources to assure properuse of these materials and the safety and fais industrial Standards. Printed on recycled paper.

	IMAIEN	IAL SAFEIT	DATA SHEET	SECTION V	HEALTH HAZAR	RD DATA	CC0265
	9 Harrisburg, PA 17101	MSDS No.	CC0252 : CC0260 CC0265	Threshold Limited Valu	e None established by AC	GIH 2001.	
	www.LabLearner.com 1.877.LEARN78	Effective D		Effects of Overexposur			
SECTION I Product Charcoal, W	NAME	24 HOUR EMERG	ENCY ASSISTANCE	• • • • • • • • • •	 probably cause some m repeated contact may ca prolonged exposure to e 	ause irritation. INHALA	TION: Repeated or
Chemical			TREC Health 0		Target organs: None kr	nown.	
Synonyms Wood Charc	oal		-226-6177 Fire 1	Emergency and First Aid Procedures			Center immediately. Induc
Formula C			Reactivity 0	anything by mouth to an unco	vomiting only if advised nscious person. EYES: Che	by appropriate medical eck for and remove contained to the second secon	personnel. Never give act lenses. Flush thorough
Unit Size up to 2.5 Kg.		HAZARD RATING	HMIS * DERATE SERIOUS SEVERE	with water for at least 15 min. SKIN: Remove contaminated	tes, lifting upper and lower ey	yelids occasionally. Get	immediate medical attent
C.A.S. No. 7440-44-0		0 1	2 <u>3</u> 4	medical attention. INHALATI	ON: Remove to fresh air. If		
SECTION II	INGREDIENTS O			difficult, give oxygen. Get me			
Principal Component(s)	%	TLV Units	SECTION VI	REACTIVITY DA		
Charcoal, wood		100%	None established.	Stability Stable	x		temperature and heat.
				Incompatibility (Materials to Avoid)	Strong oxidizers.		
	USE FOR INDOOR HEATING (Hazardous			······································
FOR EXHAUSTING F	UMES TO OUTSIDE. TOXIC FL PHYSICAL DATA		AND CAUSE DEATH.	Decomposition Produc	ts carbon dioxide.	osition on burning may p	roduce carbon monoxide a
Melting Point (°F)	Not applicable.	Specific Gravity ($H_aO = 1$)	250-600 g/l	Hazardous Polymerization	Conditions to A	void	
Boiling Point (°F)	4200°C (7624°F)	Percent Volatile	N/A	May Occur Will Not O	ceur	Not applic	able.
Vapor Pressure (mm Hg)	Negligible as solid.	by Volume (%) Evaporation Rate	N/A	SECTION VII	SPILL OR LEAK	PROCEDURES	
Vapor Density (Air=1)		(=1)	IN/A	Steps to be taken in ca		THOCEDONES	
	Not applicable.			material is released or	spilled Sweep up a		ontainer for reclamation of
Solubility in Water	Insoluble in water and/or orga				proper disp	oosal. Wash spill area w	ith soap and water.
Appearance & Odor SECTION IV	Black lumps, powder, granules	s or sticks; no odor.	ΛΤΛ	Waste Disposal Method	Discharge, treatment, or disp	osal may be subject to Fede	eral, State or Local laws.
Flash Point		ble Limits in Air	Lower Upper	Traste Disposar metrice	These disposal guidelines and	e intended for the disposal of	of catalog-size quantities only.
(Method Used) Non-\	volatile solid. % by Vo	lume N/A			disposed of in a sanitary		aminated material may be
Extinguisher Water Media Water	r fog; foam; carbon dioxide; dry cl	hemical.		SECTION VIII	SPECIAL PROTI	ECTION INFORM	ATION
	~				should be needed in norma ventilation hood or wear a NK		
SPECIAL FIREFIGHTIN				Ventilation Local Exhaus	t Yes.	Special	No.
		wear a NIOSH/MSHA-approv	ved, self-contained	Mechanical (Other	No.
	breathing apparatu	us and protective clothing.		Protective Gloves	None required.	Eye Protection	Chemical safety glasse
				Equipment Goggles	, smock, apron, fire extinguis		nd a ventilation hood.
	ONSE GUIDEBOOK, RSPA P 5	800.7, GUIDE PAGE NO. 13	33)	SECTION IX	SPECIAL PRECA	AUTIONS	
(2004 EMERGENCY RESP				Precautions to be Taken in Handling & Storing Keep container tightly closed when not in use.	Store in a dry area, awa thoroughly after handling		oxidizing materials. Wash
(2004 EMERGENCY RESP UNUSUAL FIRE AND EXPLOSION HAZARDS				noop container eginty elected international		a	
UNUSUAL FIRE AND		weak explosion hazard. Fire			n container before using. Do not wear cont y use only. Not for drug, food or household	-	licals.
UNUSUAL FIRE AND		s decomposition products; o		Other Precautions Read label of For laborato		tact lenses when working with chern d use. Keep out of reach of childrer	iicals. J.
UNUSUAL FIRE AND	produce hazardou:	s decomposition products; o		Other Precautions Read label of For laborato	n container before using. Do not wear cont y use only. Not for drug, food or household	tact lenses when working with chern d use. Keep out of reach of childrer	
UNUSUAL FIRE AND EXPLOSION HAZARDS	produce hazardou:	s decomposition products; c		Other Precautions Read label o For laborato Remove	n container before using. Do not wear cont y use only. Not for drug, food or household and wash contaminated clott 01/01/07 Approved	tact lenses when working with cherr d use. Keep out of reach of childrer hing. James A. Bertsch	Chemical Safety Coordinator JAB

ON: Call physician or Poison Control Center immediately. Induce only if advised by appropriate medical personnel. Never give . EYES: Check for and remove contact lenses. Flush thoroughly er and lower eyelids occasionally. Get immediate medical attention. h thoroughly with mild soap and water. If irritation occurs, get to fresh air. If not breathing, give artificial respiration. If breathing is **IVITY DATA** itions to Avoid Excessive temperature and heat. ers. rmal decomposition on burning may produce carbon monoxide and/or oon dioxide. itions to Avoid Not applicable. OR LEAK PROCEDURES Sweep up and place in a suitable container for reclamation or proper disposal. Wash spill area with soap and water. reatment, or disposal may be subject to Federal, State or Local laws. sal guidelines are intended for the disposal of catalog-size quantities only. in an approved incinerator or uncontaminated material may be of in a sanitary landfill. AL PROTECTION INFORMATION eded in normal laboratory handling. If dusty conditions prevail, work d or wear a NIOSH/MSHA-approved dust mask. Yes. Special No. If dusty, Other No. Eye Protection d. Chemical safety glasses. , fire extinguisher, eye wash station, and a ventilation hood. **AL PRECAUTIONS**

Revision No. 8	Date	01/01/07	Approved	James A. Bertsch	Chemical Safety Coordinator	JAB
The Information contained here them and must make independ health of employees. * Hazard	ent determina	tions of suitability and	completeness of Information	kl use this information only as a supplied of the supplied	lement to other informati use of these materials a	on gathered by rid the safety and



Cognitive Learning Systems 240 North Third Streat - Suite 1300 Harrisburg, PA 17101 www.LabLearner.com 1.877.LEARN78

MSDS No.: CC0416 Revision Date: April 1, 2008 Approved by: James A. Bertsch

MSDS No.: CC04	16		A	pproved by: Ja	mes A. Bertsch
Section 1	Chemical Product :	and Company Info	ormation		
Product	COPPER METAL	ini ini ana ana ini ana			
Synonyms	N/A				
CHEMTREC 2	24 Hour Emergency Phone Nur	nber (800) 424-930()		
Section 2	Composition / Infor	mation on Ingred	ients		
	emical Name	CAS #	%	TLV	Units
Copper		7440-50-8	100%	TWA: 1.0 mg/m TWA: 0.2 mg/m	³ dusts and mists as C ³ fume (ACGIH 2001)
Viay be harmfu	Hazards Identificat verview ATHE METAL DUST OR FUM JI if swallowed. Harmful if inha n and eyes. Avoid contact with	ES. SHARP EDGE	May cause		terate ious Fire 0 Reactivity 0

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN CONTACT: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Non-fiammable and non-combustible solid, but air-born dust may ignite. Do not use water to fight fires involving this material.

Extinguishing Media: Use triclass, dry chemical fire extinguisher.	0 = Minimal	
Flash Point: Non-combustible.	1 = Slight 2 = Moderate	\wedge
Autoignition temperature: N/A	3 = Serious 4 = Severe	$\times \times$
Explosion Limits: Lower: N/A Upper: N/A	4 = 001010	None listed.
Section 6 Accidental Release Measures		

Use proper personal protective equipment as indicated in Section 8. Remove all sources of ignition. Provide adequate ventilation. Recover for use if not contaminated. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

Section 7 Handling & Storage GENERAL STORAGE CODE GREEN

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. **Handling:** Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhale dust. Wash thoroughly after handling. Remove and wash clothing before reuse.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

Section 8 Exposure Controls / Personal Protection

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None needed in normal laboratory handling. If dusty conditions prevail, work in a ventilation hood or wear a NIOSH/MSHA-approved dust mask.

Section 9 Physical & Chemical Properti	es hundring and subscript a shadow i share the same in
Physical state: Solid.	Boiling point: 2595°C (4703°F)
Appearance: Reddish-brown, lustrous metal.	Freezing / Melting point: 1083°C (1981°F)
Odor: No odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Insoluble.
Vapor pressure (mm Hg): 1 mm @ 1628°C	Specific gravity (H ₂ O = 1): 8.92 @ 20°C
Vapor Density (Air = 1): N/A	Percent volatile (%): N/A
Evaporation rate (Butyl acetate = 1): N/A	Molecular formula: Cu
Viscosity: N/A	Molecular weight: 63.55
Section 10 Stability & Reactivity	

Chemical stability: Stable

Hazardous polymerization: Will not occur.

Conditions to avoid: Excessive temperatures, heat, sparks, open flame and other sources of ignition. Acids.

Incompatibilities with other materials: Strong acids, oxidizers, alkalies, bromates, chlorates, iodates, sodium azide, acetyline and halogens.

Hazardous decomposition products: Nitrogen oxide is reacted with nitric acid.

Section 11 Toxicological Information

Effects of overexposure: Inhalation of this material can cause intense sneezing, nausea, vomiting, weakness and metal fume fever. Ingestion of this material may cause moderate irritation to the stomach lining. If product gets into eyes, corneal abrasions may occur. May cause irritation on contact with skin. Repeated or prolonged exposure may cause liver and kidney damage, with an increased risk with Wilson's disease.

ORL-RAT LD50: N/A RTECS #: GL5325000

Section 12 Ecological Information

Data not yet available.

Section 13 Disposal Considerations These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: N/A

Shipping name: Not Regulated. Hazard class: N/A Packing group: N/A

Exceptions: N/A

Section 15 Regulatory Information

TSCA-listed, EINECS-listed (231-159-6), RCRA code D001, Ca Prop 65-Not listed.

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards.



Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 ww.LabLearner.com 1.877 LEARNTR

MSDS No .: CC0420 Revision Date: April 1, 2008 James A Dortonh Approved bur

Section 1						
	Chemical Product and	Company Info	rmation			
Product	COPPER METAL					
Synonyms	N/A					
CHEMTREC 24	Hour Emergency Phone Numbe	r (800) 424-9300)			
Section 2	Composition / Informa	ition on Ingred	ients			
Chem	nical Name	CAS#	%	TLV Units	;	al confidences
Copper		7440-50-8	100%	TWA: 1.0 mg/m ³ dust TWA: 0.2 mg/m ³ fume (AC		
May be harmful it irritation to skin a	Hazards Identification view HE METAL DUST. i swallowed. Harmful if inhaled nd eyes. Avoid contact with Nit Target organs: Liver, kidneys.	as dust or fume.			Health Fire Reactivity Contact HMIS	0 0 0 0

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN CONTACT: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Fire Fighting Measures Section 5

General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Non-flammable and non-combustible solid, but air-born dust may ignite. Do not use water to fight fires involving this material.

ExtInguishing Media: Use triclass, dry chemical fire extinguisher. Flash Point: Non-combustible.	0 = Minimal 1 = Slight	
Autoignition temperature: N/A	2 = Moderate 3 = Serious 4 = Severe	\bigtriangledown
Explosion Limits: Lower: N/A Upper: N/A		None listed.
Section 6 Accidental Release Measures		

Use proper personal protective equipment as indicated in Section 8. Remove all sources of ignition. Provide adequate ventilation. Recover for use if not contaminated. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

GENERAL STORAGE CODE GREEN Section 7 Handling & Storage

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhale dust. Wash thoroughly after handling. Remove and wash clothing before reuse.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

Section 8 Exposure Controls / Personal Protection

Engineering controls: Facilities storing or utilizing this material should be equipped with an evewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None needed in normal laboratory handling. If dusty conditions prevail, work in a ventilation hood or wear a NIOSH/MSHA-approved dust mask.

Section 9 Physical & Chemical Prop	perties
Physical state: Solid.	Boiling point: 2595°C (4703°F)
Appearance: Reddish-brown, lustrous metal.	Freezing / Melting point: 1083°C (1981°F)
Odor: No odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Insoluble.
Vapor pressure (mm Hg): 1 mm @ 1628°C	Specific gravity (H ₂ O = 1): 8.92 @ 20°C
Vapor Density (Air = 1): N/A	Percent volatile (%): N/A
Evaporation rate (Butyl acetate = 1): N/A	Molecular formula: Cu
Viscosity: N/A	Molecular weight: 63.55
Section 10 Stability & Reactivity	
Chemical stability: Stable	Hazardous polymerization: Will not occur.

Conditions to avoid: Excessive temperatures, heat, sparks, open flame and other sources of ignition. Acids.

Incompatibilities with other materials: Strong acids, oxidizers, alkalies, bromates, chlorates, iodates, sodium azide, acetyline and halogens.

Hazardous decomposition products: Nitrogen oxide is reacted with nitric acid.

Toxicological Information Section 11

Effects of overexposure: Inhalation of this material can cause intense sneezing, nausea, vomiting, weakness and metal fume fever. Indestion of this material may cause moderate irritation to the stomach lining. If product gets into eyes, corneal abrasions may occur. May cause irritation on contact with skin, Repeated or prolonged exposure may cause liver and kidney damage, with an increased risk with Wilson's disease.

ORL-RAT LD50: N/A RTECS #: GL5325000

Section 12 Ecological Information

Data not vet available.

Section 13 Disposal Considerations These disposal guidelines are intended for the disposal of catalog-size guantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: N/A Shipping name: Not Regulated. Hazard class: N/A

Packing group: N/A

Exceptions: N/A

Section 15 Regulatory Information

TSCA-listed, EINECS-listed (231-159-6), RCRA code D001, Ca Prop 65-Not listed.

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards.



Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 www.LabLearner.com 1.877.LEARN78

MSDS No.: DD0012 Revision Date: May 16, 2008 Approved by: James A, Bertsch

MSDS No.: DD001	o		A	pproved by:	James A	. Bertsch	
Section 1	- Chemical Product and	Company Infe	ormation				
Product	DEIONIZED WATER						
Synonyms	Hydrogen Oxide						
CHEMTREC 2	4 Hour Emergency Phone Numbe	er (800) 424-930	0				
Section 2	Composition / Informa	ition on Ingred	lients				
Ch	emical Name	CAS #	%		TLV Units		
Deionized wate	er	7732-18- 5	100%	None es	stablished. (ACC	91H 2001)	
Section 3 Emergency Ov NON-HAZARE Avoid contact	o na na sao ana na sao na s				0 = Minimal 1 = Slight 2 = Moderate 3 = Serious	Health Fire Reactivity	0
Section 4	:: None known. First Aid Measures	iter de la la consta	d manuar a		4 = Severe	Contact HMIS	<u> 0</u> *
	ed water should not pose any ill he elop, get immediate medical atter						
Section 5	Fire Fighting Measure						
General mon	nation: Avoid contact with Dang	erous when wet	anu water re	active mater	nais. See c	ecuoi: :0.	
						NFF	20
Extinguishing					0 = Minim	~	л \

Extinguishing Media: N/A Flash Point: N/A Autoignition temperature: N/A Explosion Limits: Lower: N/A Upper: N/A Section 6 Accidental Release Measures

Uncontaminated material may be flushed to sewer.

Section 7 Handling & Storage

GENERAL STORAGE CODE GREEN

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed to avoid absorption of fumes and carbon dioxide from air. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.

Handling: Avoid contamination.

Storage: Store in a cool, area away from water reactive or dangerous when wet substances.

Section 8 Ex		

Engineering controls: N/A

Respiratory protection: N/A

Section 9 Physical & Chemical Propertie	
Physical state: Liquid.	Bolling point: 100°C (212°F)
Appearance: Clear, colorless.	Freezing / Melting point: 0°C (32°F)
Odor: No odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Complete.
Vapor pressure (mm Hg): 14	Specific gravity (H ₂ O = 1): 0.99707 @ 20°/20°C
Vapor Density (Air = 1): 0.7	Percent volatile (%): 100%
Evaporation rate (Water = 1): 1	Molecular formula: H ₂ O
Viscosity: N/A	Molecular weight: 18.01
Section 10 Stability & Reactivity	
	••••••••••••••••••••••••••••••••••••••

Chemical stability: Stable Hazard Conditions to avoid: Absorption of fumes and carbon dioxide gas.

Hazardous polymerization: Will not occur.

Incompatibilities with other materials: Water reactive metals: sodium, potassium, calcium, barium, alkali metal alioys, liquid, amalgams, amides, carbides, hydrides, aluminum powders, sillicides, cerium, concentrated acids.

Hazardous decomposition products: Electrolysis will produce explosive and flammable hydrogen and oxygen.

Section 11 Toxicological Information

Effects of overexposure: None known when used at normal temperatures and pressure. Contact with eyes should have no ill effects, although contact with any material not specifically labeled for eye use or care should be avoided.

ORL-RAT LD50: N/A IHL-RAT LC50: N/A SKN-RBT LD50: N/A

Section 12 Ecological Information

Data not yet available.

Section 13 Disposal Considerations: These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: N/A

Shipping name: Not Regulated. Hazard class: N/A

Packing group: N/A

Exceptions: N/A

Section 15 Regulatory Information

Not listed.

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards.

	MATERI	AL SA	FETY	DATA SHEET	SECTION	V	H	EALTH HAZARI	D DAT	A	E E	E0076
LabLearr The Science of L	Cognitive Learning Systems earning 240 North Tritt Ostreet - Suite 1300 Harrisburg, PA 17101				Threshold Li	mited Va		thyl Alcohol: PEL/TLV 1 TEL: 500 ppm; Methyl /	1000 ppm; Alcohol: F	; Isopropyl Alco PEL-TWA: 200	ohol: TWA: 4) ppm, STEL.:	00 ppm, 250 ppm
Chemical Synonyms N/A Formula Mixture.	www.labloarner.com 1.877.LEARN78	-	0 CHEN 800-4 Day 585		May cause irrit vary. Ingestion death, as little Emergency a First Aid Pro anything by mo	ity to concer ation and de n of less tha as 4 mL. m and cedures puth to an u	ntrate and efatting of n 30 mL. ay be toxi	NGESTION: Can cause omiting, diarrhea. INHA irritation of the throat. J skin on prolonged conta has been fatal to humar ic if ingested. Target org NGESTION: Call physic omiting only if advised b is person. EYES: Chec	EYES: Lid act. <u>OTHE</u> ns. In gen gans: Eye sian or Poi y appropr k for and i	quid or vapor n <u>ER</u> : Individual leral a few oun les, central nerv lison Control Ce liate medical per remove contace	nay cause irrita responses to l ces may cause ous system, lin enter immediat ersonnel. Nev ct lenses. Flus	ation. <u>SKIN</u> : Methyl Alcohol e blindness and ver, kidneys. tely. Induce rer give sh thoroughly
Unit Size up to 3.7 C.A.S. No. Mixture.	85 Lt.	- HAZARI MINIMAL O	DRATING SLIGHT MO 1	DERATE SERIOUS SEVERE	SKIN: Remove	e contamina	ted clothi	ting upper and lower eye ng. Flush thoroughly wil temove to fresh air. If no	th mild so	ap and water.	If irritation occ	curs, get
SECTION II	INGREDIENTS OF	MIXTUR	ES		difficult, give ox	cygen. Get	medical a	ttention.	or breating	ig, give aranoid	a respiration.	n breathing is
Principal Compone			%	TLV Units	SECTION	VI	R	EACTIVITY DAT				
Ethyl alcohol, denatu	red*: (CAS No. 64-17-5)		95%	1000 ppm		nstable Stable	x	Conditions to Av		Excessive tempoxidizers		neat. Strong Lignition sources
Water: (CAS No. 77	32-18-5)		5%	None established.	Incompatibil			t		· · · ·		
DANGER! FLAMMA	BLE! VAPOR HARMFUL. MAY BE	FATAL			(Materials to			rs may form flammable n				y react violentity.
OR CAUSE BLINDN	ESS IF SWALLOWED. PHYSICAL DATA				Hazardous Decompositi	ion Prod	ucts	Carbon monoxide	can form	on incomplete	combustion.	
Melting Point (°F)	-114°C (-173°F)	Specific Gravity	(H,0 = 1)	0.794 @ 60°F	Hazardous Po	lymerizati	ion	Conditions to Av	roid			
Boiling Point (°F)	75-80°C (173-174°F)	Percent Volatile by Volume (%)	•	100%	May Occur	Will No		-		Not applica	ble.	
Vapor Pressure (mm H	. ,	Evaporation Ral		4.1	SECTION	l x Vii		PILL OR LEAK	PROC	EDURES		· · · ·
Vapor Density (Air=1)	1.59	(Butyl acela	te =1)		Steps to be t							
Solubility in Water	Complete.	····			material is re	eleased o	or spille	Wearing prope remove all sou	er safety e urces of ig	equipment and nition. Absorb	with adequate with an inert	ventilation, dry material
Appearance & Odor	Clear, colorless, mobile liquid; mi	iid characteris	tic odor.					and place in s	uitable co	ntainer for proj	per disposal.	
SECTION IV Flash Point (Method Used) 10°	FIRE AND EXPLOS	Limits in Air	ZARD D	ATA Lower Upper 3.3 19.0	Waste Dispo	sal Meth	Th	scharge, treatment, or disposes disposes are spose of in accordance spose spose of in accordance spose spose of in accordance spose	intended fo	r the disposal of o	catalog-size quar	ntities only.
Extinguisher Media Dry SPECIAL FIREFIGHT	chemical; Alcohol-resistant foam; or c				SECTION Respiration Protect (Specify Type)	ction Do	not use i	PECIAL PROTE in confined area. If reque				ISHA approved
PROCEDURES	breathing apparatus ar	nd full protecti	ve clothing.	A approved self-contained Water may be ineffective,	Ventilation	Local Exh	aust	Recommended.	Specia			
*Denaturants:	spill has not ignited, us	e water spray	/ to disperse	containers cool. If a leak or e vapors. Water spray may	Protective G		al (General B		Other		to maintain belo Chemical safe	ow exposure limit.
Isopropyl Alcohol: (CAS N Methyl Alcohol: (CAS No.	67-56-1) non-flammable mixture	s.		a to allute spills to	Other Protective			I				
	Autoignition Temperati ESPONSE GUIDEBOOK, RSPA P 58	•		107)	Equipment SECTION		•	on, eye wash station, pr			100d, fire extin	guisher.
UNUSUAL FIRE AND EXPLOSION HAZARI		s product ma	y travel or b	e moved by air currents	Precautions to in Handling & S Keep container lightly close	be Taken Storing	S	tore in a cool, dry, well- inition sources. Store se poroughly after handling.	ventilated eparately f	area, away fro from oxidizing		
	electrical equipment, si distant from handling s	atic discharge ource. <u>CAUT</u> sive heat may	e or other ig 10N: Flam / produce ha	nition sources at location e may not be visible in azardous decomposition	Other Precautio	Use	with adeq	er before using. Do not wear contax y. Not for drug, food or household u uate ventilation. Avoid o g vapors. Remove and	contact wit	th skin, eyes a	nd clothing. hing.	
					Revision No.		ə 01/05/			A. Bertsch	Chemical Safet Coordinator	^{ty} JAB
	thanoi, 3, PG II, Ltd Qty • 1 Lt. t of Labor "essentially similar" to form OSHA-	20	· · · · ·		them and must make inde health of employees. * Ha	u nerein is lumish ependent determi azardous Materia	ee without war hations of sulta Is Industrial St	rranty of any kind. Employers shoul ability and completeness of informati andards. Printed on recycled paper	u use this infor ion from all sou	unces to assure prope	ruse of these materia	mation gathered by als and the safety and

Lableann	Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101	AL SA	FETY MSDS No.	DATA SHEET	SECTIO Threshold		Value		HHAZAR		-	Iron (ACGIH 200	Ê0108)1).
SECTION I Product Iron (III) Ch	www.LebLearnor.com 1.877.LEARN78 NAME loride, 0.2 Molar Solution	24 HOU	Effective D	TREC USER August 6, 2007	and lacrim cyanosis, r	ere irritation, ation. Corne	pain and bu eal injury and tion, acidosis	throat, co irns. <u>EYE</u> d burns ar s, drowsin	ugh, dyspnea, <u>S:</u> Direct cont e possible. <u>IN</u> less, hypotherr	and labored act with eye GESTION:	breathing s may cau Vomiting, d	respiratory tract SKIN: Direct o se pain, redness, diarrhea, dehydra e. Target organs	ontact may blurred vision tion, shock,
Synonyms Ferric Chlor Formula Mixture. Unit Size up to 3.785 C.A.S. No. Mixture. Se SECTION II	ide, Water Solution B00-424-9300 Fire Participation Day 585-226-6177 Fire 0 Reactivity 0 Reactivity 0 HAZARD RATING HMIS * HMIS * Nithing by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thorough! e Section II. 1 2 3 4 Kining Remove contaminated clothing. Flush thorough!					er give h thoroughly ical attention. urs, get							
Principal Component		MIXTON	%	TLV Units	SECTIC Stability		ĺ	REACI	IVITY DA	void	YCESSIVE to	mperature to cau	
Iron (III) chloride: (CAS N Water: (CAS No. 7732-1			3.24% 96.76%	See Section V. None established.	Incompat		X Stro		ing agents me	Stat	ole under no	ium, potassium.	
	HARMFUL IF SWALLOWED. MA	Y CAUSE			(Materials Hazardou	s	<u> </u>	Th	ermal decomp	osition prod	ucts may it	nclude toxic and (
SECTION III	PHYSICAL DATA				Decompo						, iron and/o	r iron oxide dust	
Melting Point (°F)	Freezes approx. 0°C (32°F)	Specific Gravity		Approx. 1.0	Hazardous May Occu		Not Occur		litions to A				
Boiling Point (°F)	Approx. 100°C (212°F)	Percent Volatile by Volume (%)		96.76%			х	1			Not applica		
Vapor Pressure (mm Hg	14 (water)	Evaporation Rat (Water =1)	6	Slightly < 1	SECTIC			SPILL	OR LEAK	PROCE	DURES	5	
Vapor Density (Air⊨1) Solubility in Water	0.7 (water) Complete.				Steps to I material I			ied		wer with co area with sc		unts of water. ter.	
Appearance & Odor	Yellow-orange liquid; no odor.							N					
SECTION IV Flash Point (Method Used) Non-f	FIRE AND EXPLOS	Limits in Air	ZARD D	ATA Lower Upper	Waste Di	sposal Me			reatment, or disp sal guidelines are ewer with copic			leral, State or Local of catalog-size qual	iaws. tilties only.
Media	ny media suitable for extinguishing s	upporting fire.	•		SECTIC Respiration P	rotection			AL PROTE			MATION nditions prevail, v pirator.	vork in
SPECIAL FIREFIGHTIN PROCEDURES	IG				(Specify Type) Ventilatio	Local	Exhaust		If misty.	Special	-	orator.	
				A approved self-contained		Mecha	anical (Genera	al)	If misty.	Other		të to maintain belo	w exposure limit.
	breathing apparatus a	nd full protect	ive clothing.		Other Protective Other Protective Equipment	ve		Rubber. on, eye wa	ash station, pro	Eye Prof	tection	Chemical sa	fety glasses.
(2004 EMERGENCY RES	PONSE GUIDEBOOK, RSPA P 580	0.9, GUIDE P	AGE NO. 15	54)	SECTIC	NIX		SPECI	AL PRECA	UTION	S	· · · ·	
UNUSUAL FIRE AND EXPLOSION HAZARDS					Precautions in Handling Keep container tigh	& Storing			cool, dry area roughly after h		incompatil	ble substances.	
	In fire conditions resulting in the evaporation of the water of solution hazardous decomposition products may be produced as dust or fume. There are no unusual fire and explosion hazard associated with this solution.												
					Revision N		Date 08/0				A. Bertsch	Chemical Safet Coordinator	JAD
	oride, solution, 8, UN2582, PG III, L of Labor "essentially similar" to form OSHA-				them and must mail health of employee	nameo nerein is lu ke independent de s. * Hazardous Ma	nusnea without w terminations of su aterlals industrial (itability and co Standards. Pr	rund, Employers sho empleteness of information inted on recycled pape	aid use this inform ation from all sour ar.	ces to assure p	supplement to other infor oper use of these materia	nauon gathered by Is and the safety and

	MATERIA	AL SAFETY	DATA SHEET	SECTION V	HEALTH HAZAR	D DATA	GG0120
Lab Learne		MSDS No.	: GG0119 GG0120	Threshold Limited Valu	e As mist: TWA: 10 mg/m	³ (ACGIH 2001).	
	www.LabLearner.com 1.677.LEARN78	Effective E		Effects of Overexposur	e INGESTION: Very low h	azard. Estimating from	data, the lethal dose for a 100
SECTION I	NAME	24 HOUR EMERC	ENCY ASSISTANCE		pound person may be a c irritation. <u>SKIN:</u> No sign INHALATION: Mists are	ificant irritation. Not abs	
Product Glycerin Chemical			TREC 24-9300 Health 1		known.		
Synonyms Glycerol, 1,	2, 3-Propanetriol		-226-6177 Fire 1	Emergency and First Aid Procedures	INGESTION: Call physic	cian or Poison Control C	enter immediately. Induce
Formula HOCH ₂ CH	OHCH ₂ OH		Reactivity 0		vomiting only if advised t nscious person. <u>EYES</u> : Chec	by appropriate medical poly	ersonnel. Never give
Unit Size up to 20 Lt.		HAZARD RATING	HMIS *	with water for at least 15 minu	ites, lifting upper and lower ey	elids occasionally. Get i	mmediate medical attention.
C.A.S. No. 56-81-5		0 1	2 3 4	medical attention. INHALAT	I clothing. Flush thoroughly w ON: Remove to fresh air. If n	ith mild soap and water. ot breathing, give artifici	If irritation occurs, get al respiration. If breathing is
SECTION II	INGREDIENTS OF			difficult, give oxygen. Get me		<u>.</u>	
Principal Component	(s)	%	TLV Units	SECTION VI Stability Unstable	REACTIVITY DA	void	
Glycerin		> 99.5%	See Section V.		X	703010311	oisture from air. temperature and heat.
				Incompatibility (Materials to Avoid)	Oxidizing agents such as soc potassium chlorate, chromiur	lium hypochlorite, hypoch n trioxide, potassium per	hlorous acid, nitric acid, manganate.
	D CONTACT WITH STRONG OXIDI	ZING MATERIALS.		Hazardous	Acrolein fumes.		
SECTION III	PHYSICAL DATA			Decomposition Produc			
Melting Point (°F)	18°C (64°F)	Specific Gravity $(H_2O = 1)$	1.2607 (25/25°C)	Hazardous Polymerization May Occur Will Not O		AVOID a CC	ndition of excessive heat (in 200°C) while exposed to
Boiling Point (°F)	~ 260°C (554°F)	Percent Volatile by Volume (%)	N/A	X			ric oxygen.
Vapor Pressure (mm Hg)	< 0.01 mbar @ 20°C	Evaporation Rate (Ether =1)	Greater than 1.	SECTION VII	SPILL OR LEAK	PROCEDURES	
Vapor Density (Air=1)	N/A			Steps to be taken in car material is released or	Sman spins.	Flush to sewer with copi	
Solubility in Water	Complete (100%).				material and	Absorb in sand, vermicu place in a suitable conta	
Appearance & Odor	Clear, water white liquid; no odor				incineration.		- 1 - Distance
SECTION IV	FIRE AND EXPLOS		ATA Upper	Waste Disposal Method	Discharge, treatment, or dispo These disposal guidelines are	intended for the disposal of	al, State of Local laws. catalog-size quantities only.
(Method Used) 177	PC (351°F) COC Flammable L % by Volum				Dispose of in an approve service.	d incinerator or contract	with a licensed waste disposal
Extinguisher Media Car	bon dioxide; dry chemical; water spra	y; alcoho! foam.		SECTION VIII	SPECIAL PROTE		
SPECIAL FIREFIGHTIN	IG			(Specify Type) None	e needed in normal laboratory		
PROCEDURES				Ventilation Local Exhause		Special Other	No
	In fire conditions, wear breathing apparatus.	a NIOSH/MSHA-approve	ed self-contained	Protective Gloves	None needed.	Eye Protection	Chemical safety glasses.
				Other Protective Smock	, apron, eye wash station, gog	gles, fire extinguisher.	
				SECTION IX	SPECIAL PRECA	UTIONS	
UNUSUAL FIRE AND EXPLOSION HAZARDS	3			Precautions to be Taken in Handling & Storing Keep container tightly closed when not in use.	Store in a cool, dry place Wash thoroughly after ha		ers and fire hazards.
		us Acrolein may be form g materials. Contact with		Other Precautions Read label of Earl label o	in container before using. Do not wear container before using, food or household	act lenses when working with chemic	als.
	agents such as chromit	um trioxide, potassium cl			iy use uniy. Not us urug, tood of household	use, neep out or reach or children,	
	permanganate may pro	uuce explosion.		Remove	and wash contaminated cloth	iing.	
					01/10/07 Approved	James A. Bertsch	Chemical Safety JAB Coordinator JAB
D.O.T. NON-REG				The information contained herein is furnished w them and must make independent determinatio health of employees. * Hazardous Materials ind	ithout warranty of any kind. Employers shouns of suitability and completeness of informa historial Standards. Bristod on provide a	Id use this information only as a sup tion from all sources to assure prope	plement to other Information gathered by truse of these materials and the safety and
Approved by U.S. Department o	f Labor "essentially similar" to form OSHA-2	20		Reput of employees. Prazardous materials inc	ичанна отановнов, плящео он тесусіво раре	а,	

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Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 www.Lablearner.com .877.LEARN78

MSDS No.: HH0094 Revision Date: April 1, 2008 Approved by: James A. Bertsch

MSDS No.: HH0094				pprovea by:	ournoo,	. Berisch	
Section 1	Chemical Product and						
Product	HYDROCHLORIC ACI	D, 3 MOLAR	(3 NORM	AL)			
Synonyms	Muriatic acid, water solution	n; Hydrogen ch	loride, wate	r solution			
CHEMTREC 24	4 Hour Emergency Phone Numbe	er (800) 424-9300)				
Section 2	Composition / Inform	ation on Ingred	ients				
Che	emical Name	CAS #	%	٦	LV Units		
Hydrochloric ad	cid	7647-01-0	9.43%	TWA: 5 p		IH 2001)	
Nater		7732-18-5	90.57%	None est	ablished.		
Section 3	Hazards Identification						
mergency Ov	erview		and a second	n	= Minimal	Health	3
VARNING! C				1	= Slight	Fire	Ō
	SWALLOWED. IRRITANT TO E				= Moderate = Serious	Reactivity	2
	the chlorine type bleaches or other by the chlorine type bleaches or other by the chlorest or swallow.	nousenoid chemi	cais. Reep a	intuy -	= Severe	Contact	4
	Respiratory system, skin, eyes,	lungs.				HMIS	*
Section 4	First Ald Measures	o de la compañía					
CARRANCE A	in or and measures	ale a la la la consta					

medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN CONTACT: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

General Information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool.

Extinguishing Media: Carbon dioxide, dry chemical, dry sand, alcohol foam. Flash Point: Not combustible.

Autoignition temperature: N/A

Explosion Limits: Lower: N/A Upper: N/A

Section 6 Accidental Release Measures

Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation. Neutralize spill with sodium bicarbonate or calcium hydroxide, absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

(2004 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.9, GUIDE PAGE NO. 157)

Section 7 Handling & Storage CORROSIVE STORAGE CODE WHITE

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhate vapors, spray or mist. Wash thoroughly after handling. Remove and wash clothing before reuse. Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from physical damage and sunlight. Protect from moisture.

Section 8 Exposure Controls / Personal Protection

Engineering controls: Facilities storing or utilizing this material should be equipped with an evewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, googles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: Use a chemical fume hood and/or wear a NIOSH/MSHA-approved respirator.

Section 9 Physical & Chemical Pro	perties
Physical state: Furning liquid.	Boiling point: ~100°C (~212°F) [water]
Appearance: Clear, colorless.	Freezing / Meiting point: ~0°C (~32°F) [water]
Odor: Pungent odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Soluble.
Vapor pressure (mm Hg): 14 [water]	Specific gravity (H ₂ O = 1): 1.0 [water]
Vapor Density (Air = 1): 0.7 [water]	Percent volatile (%): 100%
Evaporation rate (=1): N/A	Molecular formula: Mixture.
Viscosity: N/A	Molecular weight: Mixture.
Section 10 Stability & Reactivity	

Chemical stability: Stable Conditions to avoid: Containers may burst when heated. Avoid contact with water.

Hazardous polymerization: Will not occur.

Incompatibilities with other materials: Metals, bases, active metals, alkali metals, oxidizing agents, hydroxides, amines, carbonates, cyanides, sulfides, sulfites, formaldehyde.

Hazardous decomposition products: Hydrogen, chlorine.

Section 11 Toxicological Information

Effects of overexposure: Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. Vapors are irritating and may cause damage to the eyes, Splashes may cause severe burns and permanent eve damage. Can cause redness, pain, and severe skin burns. Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract.

RTECS #: MW4025000 [Hydrochloric acid]

Section 12 Ecological Information

The methods for determining the biological degradability are not applicable to inorganic substances. Harmful ecological effects due to the pH shift are expected.

Section 13 Disposal Considerations These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local. state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: UN1789

Shipping name: Hydrochloric acid Hazard class: 8

Packing group: II

Exceptions: Ltd Qty • 1 Lt.

Section 15 Regulatory Information

TSCA-listed, EINECS-listed (231-595-7), RCRA code D002.

Additional Information Section 16

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards.





Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 ww.LabLeamer.com

MSDS No.: HH0180 Revision Date: April 1, 2008

	1.877.LEARN7B		A	pproved by: James A. Bertsch
MSDS No.: HH018				
Section 1	Chemical Product and	Company Info	ormation	
Product	HYDROGEN PEROXID	E, 3%		
Synonyms	Hydrogen peroxide aqueou	s solution, stat	ilized	
CHEMTREC 2	4 Hour Emergency Phone Numbe	r (800) 424-930	C	
Section 2	Composition / Informa	ition on Ingred	ients	
Ch	emical Name	CAS #	%	TLV Units (ACGIH 2001)
Hydrogen perc Water Acetaniiide	xide	7722-84-1 7732-18-5 103-84-4	3% 97% 0.05%	TWA: 1 ppm None established. None established.
Section 3	Hazards Identification			
Emergency Ov	verview			0 = Minimal Health 0

CAUTION!

IRRITANT. MAY CAUSE IRRITATION TO SKIN AND EYES ON CONTACT. Avoid contact with skin, eyes and clothing. Avoid contamination from any source,

= Minimal	Health	0		
= Slight	Fire	0		
= Moderate = Serious	Reactivity	1		
= Severe	Contact	1		
	HMIS	*		

NFPA

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Section 4 First Aid Measures

Do not alter or tamper with venting mechanism.

Target organs: None known.

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN CONTACT: Remove contaminated clothing. Flush thoroughly with mild scap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool. Use water only to fight fires in which this material is involved. Apply vast amounts for cooling and dilution. This product is a strong oxidizer which may release oxygen and promote the combustion of flammable materials. Spontaneous combustion can occur if allowed to remain in contact with oxidizable materials. Drving of product on clothing or combustible material may cause fire. Do not allow temperature of storage to rise above 100°F.

Extinguishing Media: Use media suitable for extinguishing supporting fire. Flash Point: N/A Autoignition temperature: N/A	0 = Minimal 1 = Slight 2 = Moderate 3 = Serious
Explosion Limits: Lower: N/A Upper: N/A	4 = Severe
Section 6 Accidental Bolease Massures	

Use proper personal protective equipment as indicated in Section 8. Remove all sources of ignition. Provide adequate ventilation. Recover for use if not contaminated. Dilute with water and absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

Section 7 Handling & Storage

GENERAL STORAGE CODE GREEN

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhale vapors, spray or mist. Wash thoroughly after handling. Remove and wash clothing before reuse. Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

Section 8 Exposure Controls / Personal Protection

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low,

Respiratory protection: Use a chemical fume hood and/or wear a NIOSH/MSHA-approved respirator.

Section 9 Physical & Chemical Properti	es de color de la color de
Physical state: Liquid.	Boiling point: ~100°C (212°F) (water)
Appearance: Clear, colorless.	Freezing / Melting point: ~0°C (32°F) (water)
Odor: Slightly pungent odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Complete.
Vapor pressure (mm Hg): 14 (water)	Specific gravity (H ₂ O = 1): ~1.0
Vapor Density (Air = 1): 0.7 (water)	Percent volatile (%): 100%
Evaporation rate (Butyl acetate = 1): < 1	Molecular formula: Mixture.
Viscosity: N/A	Molecular weight: Mixture.
Section 10 Stability & Reactivity	

Chemical stability: Stable

Hazardous polymerization: Will not occur.

Conditions to avoid: Excessive temperatures, heat, sparks, open flame and other sources of ignition. Contact with combustible materials may result in spontaneous combustion.

Incompatibilities with other materials: Acids, bases, metals, metal salts, reducing agents, organic materials, alkalies, dust and dirt contaminants, flammable substances, oxidizable materials.

Hazardous decomposition products: Oxygen, which will promote the combustion of flammable material.

Section 11 Toxicological Information

Effects of overexposure: EYES: Expected to cause irritation and/or burns. Could cause corneal damage which may occur several days later. SKIN: Expected to cause irritation and/or burns. As the concentration or time of exposure increases, the extent of damage increases. INHALATION: Expected to be irritating to respiratory tract, INGESTION: Expected to cause burns to the gastrointestinal tract. Medical conditions which may be appravated by exposure include conjunctivitis of the eye, dermatitis of the skin, asthma and respiratory diseases.

ORL-RAT LD50: 800 mg/kg (50% hydrogen peroxide)

Section 12

Data not yet available.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size guantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local state and federal regulations or contract with a licensed chemical disposal agency.

Transport Information Section 14

UN/NA number: N/A Shipping name: Not Regulated. Hazard class: N/A

Packing group: N/A

Exceptions: N/A

Section 15 Regulatory Information

Ecological Information

TSCA-listed, EINECS-listed (231-765-0), RCRA code D001, D002.

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of sultability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards,

Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 www.LabLearner.com MSDS No.: IX0160 Revision Date: April 1, 2008 1 877 I FARN78 Approved by: James A. Bertsch MSDS No 1X0160 **Chemical Product and Company Information** Section 1 Product IODINE POTASSIUM IODIDE SOLUTION Synonyms Iodine-Iodide Solution: Lugol's Dilute; Starch Test; Grams Iodine Stain CHEMTREC 24 Hour Emergency Phone Number (800) 424-9300 Section 2 Composition / Information on Ingredients Chemical Name CAS # % TLV Units lodine 7553-56-2 1.85% STEL: C 0.1 ppm Potassium iodide 7681-11-0 3.05% None established. 7732-18-5 95.1% None established. Water (ACGIH 2001) Section 3 Hazards Identification **Emergency Overview** Health з 0 = Minimal1 = Slight WARNING! CORROSIVE! Fire 0 2 = Moderate HARMFUL IF INHALED OR SWALLOWED. CAUSES BURNS TO SKIN AND Reactivity 1 3 = Serious EYES. Avoid contact with skin, eves and mucous membranes. Contact 2 4 = Severe When heated, produces iodine vapor. HMIS Target organs: None known. Section 4 First Aid Measures

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower evelids occasionally. Get immediate medical attention.

SKIN CONTACT: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and

full protective gear. Use flooding amounts of water during early stages of fire. When heated, emits violet colored fumes of lodine which are toxic and corrosive to metals and all body tissues.

Extinguishing Media: Carb	bon dioxide, dry chemical, water spray, alcohol foam.	0 = Minimal
Flash Point: N/A		1 = Slight 2 = Moderate
Autoignition temperature:	N/A	3 = Serious 4 = Severe
Explosion Limits: Lower:		
Section 6 Accil	dental Release Measures	

Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation. Recover for use if not contaminated. Absorb with inert dry material, sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

Section 7 Handling & Storage

CORROSIVE STORAGE CODE WHITE

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhale vapors, spray or mist. Wash thoroughly after handling. Remove and wash clothing before reuse. Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Exposure Controls / Personal Protection Section 8

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low,

Respiratory protection: Use a chemical fume hood and/or wear a NIOSH/MSHA-approved respirator.

Section 9 Physical & Chemical Prope	rties
Physical state: Liquid.	Boiling point: ~100°C (212°F) (water)
Appearance: Deep, amber color.	Freezing / Melting point: ~0°C (~32°F) (water)
Odor: Iodine odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Complete.
Vapor pressure (mm Hg): 14 (water)	Specific gravity (H ₂ O = 1): 1.0 (water)
Vapor Density (Air = 1): 0.7 (water)	Percent volatile (%): 95.1%
Evaporation rate (Butyl acetate = 1): < 1	Molecular formula: Mixture.
Viscosity: N/A	Molecular weight: Mixture.
Section 10 Stability & Reactivity	
Chemical stability: Stable	Hazardous polymerization: Will not occur.

Chemical stability: Stable Conditions to avoid: Excessive temperatures and heat to cause evaporation.

Incompatibilities with other materials: Contact of gaseous ammonia or its solutions with free jodine should be avoided to prevent the formation of the explosive "nitrogen iodide". Acetaldehyde, sodium azide, sodium hydride,

Hazardous decomposition products: Free iodine.

Section 11 Toxicological Information

Effects of overexposure: Contact as fumes or solution is intensely irritating to eyes, skin and mucous membranes. May cause delayed lung injury. Ingestion of large quantities of this material causes abdominal pain, vomiting and diarrhea. In severe cases, purging, excessive thirst and circulatory failure may develop.

ORL-HUM LD50: 2-4 gm as iodine IHL-RAT LC50: N/A SKN-RBT LD50: N/A

Ecological Information Section 12

Data not yet available.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size guantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Transport Information Section 14

UN/NA number: N/A

Shipping name: Not Regulated. Hazard class: N/A

Packing group: N/A

Exceptions: N/A

Section 15 **Regulatory Information**

None listed.

NFPA

None listed

Additional information Section 16

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards.



Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 www.LabLearner.com 1 877 1 EARN78

MSDS No 1 IX0210 Revision Date: April 24, 2008 Approved by: James A. Bertsch

MSDS No.: IX0210

Section 1 Chemical Product and Company Information Product **IRON METAL FILINGS, DEGREASED, 40-60 MESH** Synonyms Iron Addregate

CHEMTREC 24 Hour Emergency Phone Number (800) 424-9300

Section 2 Composition / In	iformation on Ingree	lients	
Chemical Name	CAS #	%	TLV Units
Iron aggregate Contains:	65997-19-5	100%	
Iron	1309-37-1	>90%	TWA: 5 mg/m ³
Carbon	7440-44-0	<4.0%	N/A
Silicon	7440-21-3		TWA: 10 mg/m ³
Manganese	7439-96-5		TWA: 0.2 mg/m ³
Chromium	7440-47-3	<0.0-0.2%	TWA: 0.5 mg/m ³ (metal and Cr III compounds) (ACGIH 2001)

Section 3 Hazards Identification

Emergency Overview

CAUTION!

Iron dust dispersed in air may constitute a fire and/or explosion hazard. Iron dust may cause irritation and/or inflammation of the skin, eyes, mucous membranes and lungs. Target organs: None known.

ght	Fire	0
derate ricus	Reactivity	1
vere	Contact	1
	HMIS	*

NFPA

None listed.

Health

0 = Minimal

1 = Slic

2 = Mo

3 = Se

4 = Se

First Aid Measures Section 4

INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen, Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN CONTACT: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

Section 6 Accidental Release Measures

General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool. A fire hazard in the form of a fine dust dispersed in air or by chemical reaction with strong oxidizers can be an explosion hazard, especially when heated,

Extinguishing Media: Use dry chemical, dry sand or graphite for extinguishing fire.	0 = Minimal
Flash Point: N/A	t = Slight 2 = Moderate
Autoignition temperature: N/A	3 = Serious 4 = Severe
Explosion Limits: Lower: N/A Upper: N/A	4 - 369618

Use proper personal protective equipment as indicated in Section 8. Remove all sources of ignition. Provide adequate ventilation. Recover for use if not contaminated. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

Section 7 Handling & Storage GENERAL STORAGE CODE GREEN

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion, Do not inhale dust. Wash thoroughly after handling. Remove and wash clothing before reuse. Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition

sources.

Exposure Controls / Personal Protection Section 8

Engineering controls: Facilities storing or utilizing this material should be equipped with an evewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low,

Respiratory protection: None needed in normal laboratory handling. If dusty conditions prevail, work in a ventilation hood or wear a NIOSH/MSHA-approved dust mask.

Section 9 Physical & Chemical Propertie	es in the second state of the s
Physical state: Solid:	Boiling point: N/A
Appearance: Grey particles.	Freezing / Melting point: 1508.49°C (2750°F)
Odor: No odor	Decomposition temperature: N/A
pH: N/A	Solubility: Insoluble.
Vapor pressure (mm Hg): N/A	Specific gravity (H2O = 1): 6.7 gm/cc
Vapor Density (Air = 1): N/A	Percent volatile (%): N/A
Evaporation rate (Butyl acetate = 1): N/A	Molecular formula: Mixture.
Viscosity: N/A	Molecular weight: Mixture.
Section 10 Stability & Reactivity	
Observational advantabilities of Controls	

Chemical stability: Stable

Hazardous polymerization: Will not occur. Conditions to avoid: Excessive temperatures, heat, sparks, open flame and other sources of ignition. Acids.

Incompatibilities with other materials: Strong oxidizers, organic acids, mineral acids, water.

Hazardous decomposition products: None.

Section 11 Toxicological Information

Effects of overexposure: Iron dust is an eye, skin and mucous membrane irritant. May cause irritation and inflammation of the eyes and lungs. Exercise appropriate procedures to minimize potential hazards.

OBL-RAT LD50: 30 am/ka

Section 12 Ecological Information

Data not vet available.

Disposal Considerations Section 13

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local. state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information

UN/NA number: N/A Shipping name: Not Regulated.

Hazard class: N/A Packing group: N/A

Exceptions: N/A

Section 15 Regulatory Information

TSCA-listed, EINECS-listed (231-096-4), RCRA code D001, Ca Prop 65-Not listed.

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials industrial Standards.

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	he Science of Learn			MSDS No	.: 1X023	30		
_		1,877,LEARN78		Effective [Date: Janu	ary 11, 2007	Effects of	i Overex
SECTIO	DN I	NAME	24 HOU	R EMERO	GENCY AS	SSISTANCE		cking and , nose and
Product	Isopropyl A	Icohol, 70% Solution	<u> </u>		ITREC H	ealth 1		s). Target c
Chemical Synonyms	Isopropano	, Water Solution		())	24-9300	ire 3	Emergen	
Formula	Mixture.			A	B	eactivity 1	First Aid	y mouth to
Unit Size	up to 20 Lt.			D RATING SLIGHT MO	DERATE SERU	HMIS *	with water	for at least
C.A.S. No.	Mixture.		0	1	2 3		medical at	move conta tention. IN
SECTIO		INGREDIENTS	OF MIXTUR		1	·		ve oxygen.
	Component(%	TLV	' Units	SECTIO	Unstab
Isc	propyl alcohol:	CAS No. 67-63-0		70%	TWA: 400 p	pm STEL: 500 ppm	Stability	Stable
Wa	ter: CAS No. 7	732-18-5		30%	None est	ablished.	Incompat	
W/	RNING! FLAM	IMABLEI					(Materials	
		ALLOWED. CAUSES EYE IRI					Hazardou Decompo	
SECTIO		PHYSICAL DAT					Hazardous	
Melting Poi		Approx50°C (-58°F)	Specific Gravity Percent Volatile	-	Approx.	. 0.8	May Occu	
Boiling Poir	<u> </u>	85° - 100°C (185 - 212°F)	by Volume (%)		100%		OFOTIO	
· · · · · · · · · · · · · · · · · · ·	sure (mm Hg)	33 mm @ 20°C (Pure IPA)) (n-Butyl ace		>1		SECTIO Steps to I	
Vapor Den:		2.1 (Pure IPA)					material i	
Solubility in		Complete.						
Appearance SECTIC		Clear, colorless liquid; mild			ATA		Waste Dis	enosal
Flash Point			able Limits in Air		Lower	Upper	- Husie Di	5003011
(Method Used) 21.7°C (7	71°F) TCC (for 70%) % by 1	Volume Pure IP	A	2%	12%		
Extinguisher Media	"Alcohol	foam", carbon dioxide, dry che	mical, water spray	<i>ı</i> .			SECTIC Respiration P	
	IREFIGHTIN	G If involved in fire situ	ation, wear a NIC	SH/MSHA-	approved		(Specify Type)	<u>) </u>
PROCEDU	RES	self-contained breati with skin and eyes.					Ventilatio	n Mec
		Autoignition Temper	-			-	Protective	
		Cool Flame: 360°C				are it yy.	Other Protectl Equipment	ve
(2004 EME	RGENCY RESP	ONSE GUIDEBOOK, RSPA P	5800.9, GUIDE	PAGE NO	129)		SECTIC	
UNUSUAL							Precaution in Handling	
EXPLOSIC	N HAZARDS	Vapors are heavier t by ventilation and ig					Keep container tigh	tily closed when
		smoking, electric mo	otors, or ignition so	ources at loc	ations distan	t from material	Other Preca	autions
		handling point. CAL excessive heat may						
		vigorously with oxidi	zing materials.	,				
							Revision N	
D.O.T.		propanol, 3, PG II, Ltd Qty • 1 Labor "essentially similar" to form O			<u> </u>		The information con them and must mat health of employee	ke independent

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SECTIO	IN V		EALTH HAZAR	DAIA	IX0230						
Threshold	Limited V	S1	None established for 70% Isopropyl alcohol. For Isopropanol: TWA 400 ppm STEL: 500 ppm ACGIH 2001. Human, oral LDLo: 2371 mg/kg. Rabbit, skin LD50: 16 mg/kg.								
drying, crac cause eye,	nose and thro	ca atting of the s pat irritation	INGESTION: 100 mL can be fatal. Aspiration hazard. EYES: Liquid may cause irritation. SKIN: Prolonged or repeated contact may cause irritation and the skin. INHALATION: Exposure to high concentrations (>400 ppm) may tion and excessively high concentrations may cause narcosis (drowsiness, ntral nervous sytem, liver, kidneys.								
anything by with water f <u>SKIN:</u> Ren medical atte	Procedure mouth to an for at least 15 nove contamir	unconscious minutes, lifti nated clothir L ATION: Re	printing only if advised s person. <u>EYES</u> : Che ing upper and lower e ing. Flush thoroughly v emove to fresh air. If	by appropriate med ck for and remove /elids occasionally. /ith mild soap and w	trol Center immediately. Inc lical personnel. Never give contact lenses. Flush thorou Get immediate medical and vater. If irritation occurs, get artificial respiration. If breath	ughly ention t					
SECTIO	N VI	R	EACTIVITY DA	TA							
Stability	Unstable		Conditions to A	woid	ssive temperature, heat, spa	arks d					
	Stable	х		flam	э.						
Incompati (Materials	ibility to Avoid)	Strong with th	g oxidizing materials, o nis alcohol. Aluminum		l compounds can react vigor leum.	rously					
Hazardou: Decompos	s sition Proc	ducts	Thermal decomp carbon monoxide		vill produce carbon dioxide a	and/or					
Hazardous	Polymeriza	ition	Conditions to A	void							
May Occu	r Will N	ot Occur	Not applicable.								
SECTIO Steps to b material is	N VII e taken in	case	d material is ha small spills or	PROCEDUR nition sources. Pro ndled and disposed paper; evaporate	ES wide adequate ventilation. T of as a flammable liquid. A sopropyl alcohol in an exhal	Absori ust					
Steps to b	N VII be taken in s released	case or spille hod Dis	d Remove all ig material is ha small spills or hood; burn pa public water v charge, treatment, or disp see disposal guidelines an	PROCEDUR nition sources. Pro- ndled and disposed paper; evaporate uper after evaporati vays. osal may be subject to a intended for the disp	ES vide adequate ventilation. T l of as a flammable liquid. A sopropyl alcohol in an exhat on. Prevent flow to sewers a Federal, State or Local laws. ssal of catalog-size quantities onl	Absori ust and ly.					
Steps to b material is Waste Dis	N VII be taken in s released posal Met	case or spille hod Dis	d Remove all ig material is ha small spills or hood; burn pa public water v charge, treatment, or disp see disposal guidelines an	PROCEDUR nition sources. Pro- ndled and disposed paper; evaporate uper after evaporati vays. osal may be subject to a intended for the disp	ES vide adequate ventilation. T l of as a flammable liquid. A sopropyl alcohol in an exhar on. Prevent flow to sewers a Federal, State or Local laws.	Absort ust and ly.					
Steps to b material is	N VII be taken in s released posal Met	case or spille hod Dis The Dis	Remove all ig material is ha small spills or hood; burn pa public water to charge, treatment, or disp esse disposal guidelines ar pose of in an approved PECIAL PROTI	PROCEDUR nition sources. Pro ndied and disposed paper; evaporate uper after evaporati vays. osal may be subject to intended for the disp i incinierator equipp ECTION INFO	ES wide adequate ventilation. T of as a flammable liquid. A sopropyl alcohol in an exhan on. Prevent flow to sewers a Federal, State or Local laws. seal of catalog-size quantities on ad with an afterburner and so	Absori ust and ly. crubb					
Steps to b material is Waste Dis SECTIO Respiration Pr	N VII be taken in s released posal Met	case or spille hod Dis The Dis Use SI Vone should brevail, work chaust	d Remove all ig material is ha small spills or hood; burn pa public water v charge, treatment, or disp ese disposal guidelines an pose of in an approver PECIAL PROTI be needed in normal in ventilation hood or None needed.	PROCEDUR nition sources. Pro ndied and disposed paper; evaporate uper after evaporate vays. osal may be subject to be intended for the disp d incinerator equipp ECTION INFO laboratory use at ro wear a NIOSH/MS	ES vide adequate ventilation. T l of as a flammable liquid. A sopropyl alcohol in an exhat on. Prevent flow to sewers a Federal, State or Local laws. osal of catalog-size quantities onl ad with an afterburner and so DRMATION om temperature. If misty oc HA-approved respirator, No.	Absort ust and ly. crubb					
Steps to b material is Waste Dis SECTIO Respiration Pr (Specify Type) Ventilation	N VII be taken in s released posal Met otection N F n Local En Mechani	case or spille hod Dis The Dis None should orevail, work thaust ical (General)	Remove all ig material is ha small spills or hood; burn pa public water to charge, treatment, or disp ase disposal guidelines an pose of in an approved PECIAL PROTI be needed in normal in ventilation hood or <u>None needed</u> . None needed.	PROCEDUR nition sources. Pro ndied and disposed paper; evaporate uper after evaporate vays. osal may be subject to be intended for the disp d incinerator equipp ECTION INFO laboratory use at ro wear a NIOSH/MS Special Other	ES wide adequate ventilation. T l of as a flammable liquid. A sopropyl alcohol in an exhan on. Prevent flow to sewers a Federal, State or Local laws. ssal of catalog-size quantities onl ad with an afterburner and so DRMATION om temperature. If misty co TA-approved respirator. No. No.	Absort ust and ly. crubb					
Steps to b material is Waste Dis SECTIO Respiration Pr (Specify Type) Ventilation Protective Other Protectly	N VII be taken in s released posal Met n Local Es Mechani e Gloves	Case or spille	d Remove all ig material is ha small spills or hood; burn pa public water v charge, treatment, or disp rese disposal guidelines ar pose of in an approved DECIAL PROTI be needed in normal in ventilation hood or <u>None needed.</u> None needed. Rubber.	PROCEDUR nition sources. Pro- ndled and disposed paper; evaporate upper after evaporate vays. osal may be subject to intended for the disp d incinerator equipp ECTION INFO EDION INFO Special Other Eye Protection	ES wide adequate ventilation. T lof as a flammable liquid. A sopropyl alcohol in an exhan on. Prevent flow to sewers a Federal, State or Local laws. seal of catalog-size quantities onl ad with an afterburner and so DRMATION promemperature. If misty con HA-approved respirator. No. No. Chemical safety gog	Absori ust and ly. crubb					
Steps to b material is Waste Dis SECTIO Respiration Pr (Specify Type) Ventilation Protective Other Protectly Equipment	N VII pe taken in s released posal Met posal Met N VIII rotection F n Local Ex- Mechania e Gloves re	case or spille hod Dis The Dis Dis Stone should orevail, work thaust ical (General) b coat, eye	d Remove all ig material is ha small spills or hood; burn pa public water v charge, treatment, or disp ese disposal guidelines ar pose of in an approved PECIAL PROTI be needed in normal in ventilation hood or <u>None needed</u> . None needed. Rubber.	PROCEDUR nition sources. Pro- ndled and disposed paper; evaporate upper after evaporate vays. osal may be subject to intended for the disp d incinerator equipp ECTION INFC laboratory use at ro wear a NIOSH/MS Special Other Eye Protection guisher, proper glo	ES vide adequate ventilation. T l of as a flammable liquid. A sopropyl alcohol in an exhat on. Prevent flow to sewers a Federal, State or Local laws. basel of catalog-size quantities onl ad with an afterburner and so PRMATION pom temperature. If misty oc HA-approved respirator. No. No. No. No. Chemical safety gog ves, ventilation hood.	Absori ust and ly. crubb					
Steps to b material is Waste Dis SECTIO Respiration Pr (Specify Type) Ventilation Protective Other Protective Other Protective SECTIO Precautions in Handling	N VII pe taken in s released sposal Met posal Met N VIII n Local Es Mechania e Gloves re La N IX s to be Taker & Storing	hod Dis hod Dis boone should prevail, work thaust tical (General) b coat, eye St	Remove all ig material is ha small spills or hood; burn pa public water to charge, treatment, or disp ase disposal guidelines an pose of in an approved PECIAL PROTE be needed in normal in ventilation hood or None needed. None needed. Rubber. wash station, fire extir PECIAL PREC	PROCEDUR nition sources. Pro- ndied and disposed paper; evaporate uper after evaporate uper after evaporate vays. osal may be subject to intended for the disp d incinerator equipp ECTION INFO laboratory use at ro wear a NIOSH/MS Special Other Eye Protection aguisher, proper glo AUTIONS ay from oxidizing n	ES wide adequate ventilation. T lof as a flammable liquid. A sopropyl alcohol in an exhan on. Prevent flow to sewers a Federal, State or Local laws. seal of catalog-size quantities onl ad with an afterburner and so DRMATION promemperature. If misty con HA-approved respirator. No. No. Chemical safety gog	Absort ust and ly. crubb					
Steps to b material is Waste Dis SECTIO Respiration Pr (Specify Type) Ventilation Protective Other Protectly Equipment SECTIO Precautions	N VII pe taken in s released posal Met n Local Es m Local Es Mechania e Gloves re La N IX s to be Taker & Storing dy dosed when not in unitions Read	case or spille bod Dis The Dis Vone should revail, work thaust cal (General) F b coat, eye SI St vuse. W	Remove all ig material is ha small spills or hood; burn pa public water to charge, treatment, or disp ase disposal guidelines an pose of in an approved PECIAL PROTE be needed in normal in ventilation hood or None needed. None needed. Rubber. wash station, fire extir PECIAL PREC rore in a cool place aw ash thoroughly after h	PROCEDUR nition sources. Pro- ndied and disposed paper; evaporate uper after evaporate uper after evaporate vays. osal may be subject to intended for the disp d incinerator equipp ECTION INFO laboratory use at ro wear a NIOSH/MS Special Other Eye Protection aguisher, proper glo AUTIONS ay from oxidizing m andling.	ES wide adequate ventilation. T of as a flammable liquid. A sopropyl aicohol in an exhan on. Prevent flow to sewers a Federal, State or Local laws. seal of catalog-size quantities onl ed with an afterburner and so PRMATION bom temperature. If misty oc 1A-approved respirator. No. No. No. Chemical safety gog ves, ventilation hood. aterials and fire hazards.	Absori ust and ly. crubb					
Steps to b material is Waste Dis SECTIO Respiration Pr (Specify Type) Ventilation Protective Other Protectly Equipment SECTIO Precautions in Handling Keep container Ught	N VII pe taken in s released posal Met posal Met N VIII rotection N F n Local E Mechani e Gloves re La N IX s to be Taker & Storing ay closed when not in utions Feat Avo with	A case or spille b or spille b coat, eye case b coat, eye	Remove all ig material is ha small spills or hood; burn pa public water \u03c5 the see disposal guidelines an pose of in an approved PECIAL PROTE be needed in normal in ventilation hood or None needed. None needed. Rubber. wash station, fire extir PECIAL PREC to re in a cool place aw 'ash thoroughly after h r before using. Do not wear con Not for drug, food or household with skin and eyes. Aw	PROCEDUR nition sources. Pro- ndled and disposed paper; evaporate uper after evaporate uper after evaporate uper after evaporate sosal may be subject to a intended for the disp intended for the disp intended for the disp CTIONINFO taboratory use at ro wear a NIOSH/MS Special Other Eye Protection auguisher, proper glo AUTIONS ay from oxidizing m andling. aci lenses when working will use. Keep out of reach of oid prolonged or re of from heat, sparks	ES vide adequate ventilation. T of as a flammable liquid. A sopropyl alcohol in an exhan on. Prevent flow to sewers a Federal, State or Local laws. seal of catalog-size quantities onl ad with an afterburner and so DRMATION om temperature. If misty co T A-approved respirator. No. No. No. Chemical safety gog ves, ventilation hood. Chemicals and fire hazards.	Use					

			FEIT		
	Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, FA 17101 www.Lableamer.com 1.877.LEARN78		MSDS No. Effective D		
SECTION I	NAME	24 HOU	R EMERC	ENCY ASSISTA	VCE
	Metal, Coated		CHEM		1
Shemical Synonyms Magnesium				4-9300 Health 226-6177 Fire	4
F ormula Mg			Δ	Reactivity	3
Unit Size up to 2.5 Kg.		HAZAR	D RATING	HMIS'*	
C.A.S. No. 7439-95-4		0		ERATE SERIOUS SEVE 2 3 4	
SECTION II	INGREDIENTS OF	MIXTUR			
Principal Component(%	TLV Units	
Magnesium metal	*		> 98%	See Section V.	
Proprietary fire ret	ardant				
DANGER! FLAM	MABLE SOLID! DANGEROUS WH	EN WET!			
	ITIVE. SEVERE EXPLOSION HAZ	ARD IF DUS	T IS SUSPE	NDED IN AIR.	
SECTION III	PHYSICAL DATA 1205°F (651°C)	Specific Gravity	$(H \Omega = 1)$	ee 1. 103	
Boiling Point (°F)	N/A	Percent Volatile	-	~ 55 lb/ft ³ N/A	
apor Pressure (mm Hg)	N/A	by Volume (%) Evaporation Ra	ເອ	N/A	
apor Density (Air=1)	N/A	(=1)		IWA	
olubility in Water	Negligible.				
Appearance & Odor	White coated, metallic powder; no o	odor.			
SECTION IV	FIRE AND EXPLOS	SION HA	ZARD D		
lesh Point Method Used) N/A	Flammable L % by Volume		、	Lower Upper	
	her with dry graphite, talc, dry sand. I OT use foam, halogenated extinguishi			xide.	
PECIAL FIREFIGHTIN ROCEDURES	explosion. Protect eyes ar of magnesium fires as eye magnesium flame. Firefigi contained breathing appar	oduce hydro nd skin agair injury may r nters should atus and pro	gen gas on d nst flying part result. Wear wear a NIOS tective clothi	ontact and may cause icles. Avoid direct view fire glasses when view GH/MSHA-approved se ng when appropriate.	ving ing
	ONSE GUIDEBOOK, RSPA P 5800	.9, GUIDE F	AGE NO. 13	8)	
INUSUAL FIRE AND XPLOSION HAZARDS	Easily ignited and burns wi Powders may form explosi spark. In finely divided forn hydrogen; also hazardous oxidizing agents and acids	ve mixtures m, will react in such form	with air whicl with water a	n may be ignited by a nd acids to release	
D.O.T. Magnesium,	m oxide and/or magnesium oxide. granules, coated, 4.3, UN2950, PC Labor "essentially similar" to form OSHA-2		/ - 1 Kg.		

OACCTV D

T | 175

TION V

hold Limited Value None established. (ACGIH 2001). Magnesium Oxide Fume: ACGIH TLV (1984) 10 mg/m³ (TWA): OSHA PEL 15 mg/m³ (TWA), ts of Overexposure Metallic magnesium particles which gain entry through cuts and scratches may uce a severe local lesion with evolution of hydrogen gas and acute inflammatory reaction. Refractory rial may cause burns to eves, throat, etc. Causes redness and/or burning sensation on skin, in eves, throat, Target organs: None known. gency and **INGESTION:** Call physician or Poison Control Center immediately. Induce Aid Procedures vomiting only if advised by appropriate medical personnel. Never give ning by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thoroughly water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. 1. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get cal attention. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is ult, give oxygen. Get medical attention. TION VI REACTIVITY DATA Conditions to Avoid Unstable Dangerous when wet. Avoid exposure to litv Stable moisture, heat, sparks and flame. х npatibility Magnesium will react with water and acids to release hydrogen; also hazardous with erials to Avoid) chlorine, bromine, iodine, oxidizing agents and acids. rdous Hydrogen will be produced - when exposed for long time to water and acids. mposition Products dous Polymerization Conditions to Avoid Occur Will Not Occur Not applicable. х TION VII SPILL OR LEAK PROCEDURES to be taken in case Avoid dusting. Use non-sparking tools. Clean dry powder may be ial is released or spilled swept gently to avoid dusting and placed in clean drums and sealed. Wet or contaminated material should be placed in vented containers and moved to a remote area for disposal by burning. Discharge, treatment, or disposal may be subject to Federal, State or Local laws. e Disposal Method These disposal guidelines are intended for the disposal of catalog-size quantities only. Dispose of in an approved incinerator or in an approved chemical landfill or contract with a licensed waste disposal service. TION VIII SPECIAL PROTECTION INFORMATION tion Protection None needed in normal laboratory handling. If dusty conditions prevail, work in ventilation hood or wear a NIOSH/MSHA-approved dust mask or respirator. Type) Local Exhaust If dusty Special No lation Mechanical (General) If dusty. Other No. ctive Gloves Fire-resistant. Eye Protection Chemical safety classes, fire classes, rotective Wear appropriate fire resistant clothing (e.g., gloves, coveralls, etc.) when exposing magnesium metal to elevated temperatures (950°F) which can cause ignition. Goggles, ent TION IX SPECIAL PRECAUTIONS itions to be Taken Store at room temperature in a dry place away from other combustibles in a dling & Storing metal cabinet. Avoid direct viewing of magnesium fires as eye injury may iner tightly closed when not in use. result. Ground all handling and transferring operations. Read label on conteiner before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Precautions Keep away from sparks, open flame, acid and dampness. Wet, moist or high humidity storage conditions will lead to corrosion of the product. Constant clean-up and good housekeeping. Chemical Safety Coordinator on No. Date 04/24/07 1 Approved James A. Bertsch JAB

HEALTH HAZARD DATA

MM0021

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. The zarrous Materials industrial Standards. Printed on recycled paper.

		AL SAFETY		SECTIO				RD DATA
LabLearr The Science of L	Cognitive Learning Systems 240 North Third Street - Suite 1300			Threshold	Limited V	IN IN	one established. (A0 984) 10 mg/m ³ (TW/	CGIH 2001). A): OSHA PE
	Harrisburg, PA 17101 www.LabLearner.com 1.877.LEARN78	MSDS No. Effective D		Effects of	Overexpo	sure E	xposure to magnesiu	m metal or oxi
SECTION I	NAME	24 HOUR EMERG	SENCY ASSISTANCE	oxide fume s	subsequent to	burning car	halation and should b result in metal fume Onset of symptoms of	e fever. The te
Product Magnes	um Metal, Ribbon, Chips, Turnings	СНЕМ		burns and c	orneal abrasic	ons. <u>SKIN:</u>	Particles of magnesic ecause of physical pro-	um embeddec
Chemical Synonyms Magnes	ium Metal		24-9300 Health 0	Emergenc		<u> </u>		
Formula Mg			-226-6177 Fire 2 Reactivity 2	First Aid F			IGESTION: Call phy omiting only if advise	d by appropri
Unit Size up to 2.	i Kg.	- NFPA HAZARD RATING	HMIS *				s person. EYES: Cr ing lower and upper	
C.A.S. No. 7439-95	-4	 MINIMAL SLIGHT MOD 0 1 	DERATE SERIOUS SEVERE	Remove co	ntaminated cl	othing. Flue	sh thoroughly with mi o fresh air. If not bre	ild soap and v
SECTION II	INGREDIENTS OF	MIXTURES		give oxygen	n. Get medica		neshan. Interpre	aning, give a
Principal Compone	ent(s)	%	TLV Units	SECTIO		R	EACTIVITY D	
Magnesium m	etal	99.8%	See Section V.	Stability	Unstable Stable	x	Conditions to	Avoia
				Incompati	bility	Magn	esium will react with	water and ac
DANGER! FL	AMMABLE SOLID!			(Materials	to Avoid)	with c	hlorine, bromine, iod	
DANGEROUS	WHEN WET. KEEP AWAY FROM AL	L IGNITION SOURCES.		Hazardous			Hydrogen will b	e produced -
SECTION III	PHYSICAL DATA			Decompos			acids.	
Melting Point (°F)	1202°F (651°C)	Specific Gravity $(H_2O = 1)$	1.74 at 20°C	Hazardous May Occur		tion ot Occur	Conditions to	Avoid
Boiling Point (°F)	2030°F (1110°C)	Percent Volatile by Volume (%)			x		·	
Vapor Pressure (mm	Hg) 1 mm at 621°C	Evaporation Rale (n-Butyl acetate =1)	SECTIO	•		PILL OR LEA	K PROCE	
Vapor Density (Air=1)	Data not listed.			Steps to b material is				use if not cont opropriate safe
Solubility in Water	Negligible (Decomposes-reacts v	vith water to yield magne	sium oxide.)				sparking too y container and sealed	ols no smoking Lagainst moist
Appearance & Odor	Silvery gray metal ribbon, chips,			Wet or contar	minated materi	al should be	placed in vented conta	ainers and mov
SECTION IV	FIRE AND EXPLOS		ATA Lower Upper	Waste Dis	posal Met	hod Dis	charge, treatment, or dis se disposal guidelines a	sposal may be s are intended for
(Method Used) 11	75°F (636°C) % by Volum	e N/A					spose of in an approv ntract with a licensed	
Extinguisher DC Media Sr	NOT USE WATER. Do NOT use foam nother with dry graphite, talc, dry sand, C	i, halogenated extinguish à-1 powder, purple K.	ing agents, or carbon dioxide.	SECTION Respiration Pro			PECIAL PROT	
SPECIAL FIREFIGH			dioxide. Manual application	(Specify Type)		ventilation h	lood or wear a NIOS	H/MSHA-app
PROCEDURES	molten magnesium. Pro	ucted with care to preven tect eyes and skin agains	st flying particles. Avoid	Ventilation	Local Ex Mechani	(haust cal (General)	If dusty.	Specia Other
	should wear a NIOSH/M	sium fires as eye injury m SHA-approved self-conta	ained breathing apparatus	Protective	Gloves	F	ire-resistant.	Eye Pro
	and protective clothing w magnesium flame.	hen appropriate. Wear f	ire glasses when viewing	Other Protective Equipment			le fire resistant clothi al to elevated tempe	
(2004 EMERGENCY R	SPONSE GUIDEBOOK, RSPA P 5800	.9, GUIDE PAGE NO. 13	38)	SECTIO			PECIAL PREC	
UNUSUAL FIRE ANI EXPLOSION HAZAF		ly ignited and burge with	intense heat and brilliant	Precautions in Handling	& Storing		ore at room tempera etal cabinet. Avoid d	iture in a dry p direct vlewing
	white flame. Powders fo	rm explosive mixtures wit	th air which may be ignited	Keep container tightly	-	G	round all handling an	~
	by a spark. In finely divid hydrogen; also hazardou		vater and acids to release ne, bromide, iodine,	Other Precau	utions For la	label on containe boratory use only	r before using. Do not wear or . Not for drug, food or househ	old use. Keep out o
	oxidizing agents and acto	ls.					igh humidity storage	
	Autoignition Temperature	+ E10°C (0E0°E)			Cor	istant clean	-up and good housel	keeping.
	Addigmation remperature	9. 510 C (950 P).						
D.O.T. Magnes	ium, 4.1, UN1869, PG III, Ltd Qty - 5 K			Revision No			07 Approved anty of any kind. Employers sl bility and completeness of infor	James /

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MM0022

Magnesium Oxide Fume: ACGIH TLV EL 15 mg/m³ (TWA).

tide dust should be a low health risk by a nuisance dust. Exposure to magnesium emporary symptoms can include fever, chills, iours after exposure. EYES: May cause d in the skin may produce lesions that resist get organs: None known.

son Control Center immediately. Induce iate medical personnel. Never give remove contact lenses. Flush thoroughly sionally. Get medical attention. <u>SKIN</u>:

water. If irritation occurs, get medical artificial respiration. If breathing is difficult,

		metrice	a altenuori.									
SECTIO	N VI		R	EAC	TIVITY DA	AT/	1					
Stability	Unst	table		Cond	ditions to A	٩vo	id	Dangerou	is wł	en wet. Avoid	iexp	osure t
	Sta	ble	х					noisture,	heat	, sparks and f	ame	
Incompat (Materials					will react with y , bromine, iodi						haza	rdous
Hazardou Decompo	-	n Proc	lucts		Hydrogen will be produced - when exposed for long time to water and acids.							
Hazardous	Polyr	neriza	tion	Con	ditions to A	Avo	id					
May Occu	r	Will N	ot Occur					Not applie	ahle			
			x	1				tor uppire		•		
SECTIO	N VI		S	PILL	OR LEAK	(PI	ROCEL	URES	5			•
Wet or conta	oduct m minated	nay be re d materi	aturned to dr al should be	y contai placed	sparking tool ner and sealed in vented contai	ls no agair iners	smoking of ast moisture and moved	open flam or place to a remo	nes ir in a s ote ar	ea for disposal	id du er for by bi	dispose
Waste Dis	posa	il Meti	hod Dis	scharge,	treatment, or dis osal guidelines a	posal	may be sub	ject to Fed	leral,	State or Local la	WS.	nku
SECTIO Respiration Pr (Specify Type)		'n	co S None need	ntract v PECI ed in no	of in an approv vith a licensed AL PROT ormal laborator wear a NIOSI	was' IEC	ie disposa TION I odâng, It	l service. NFOR	MA		rk in	ill or
		_ocal Ex		1000 01	If dusty.	1/IVIC	Special	veu aust	mas		io.	
Ventilatio	n F		cal (General)	}	If dusty.		Other				ю. ю.	
Protective				ire-resi	stant.	E	e Prote	ection	C	hemical safet		aoles.
Other Protectiv	/e	Wea	r appropria	te fire r	esistant clothir	ng (e	.g. , glove	s, covera	lls e	tc.) when expo		
Equipment		mag			evated temper				in ca	use ignition.		
SECTIO		T - (PEUI	AL PREC	ΑU	HUNS		•		÷	
Precautions n Handling Keep container light	& Sto	ring	m	ietal cal	room temperat pinet. Avoid di III handling and	irect	viewing of	magnesi	ium f	other combus ires as eye inji	stible ury n	s in a nay res
Other Preca	utions	Read For lat	label on containe coratory use only	er belione us /. Not for d	sing. Do not wear col Irug, food or househo	ntact le lid use.	nses when wo Keep out of re	king with cher each of chlidre	micals. In.			
		Wet	, moist or h	nigh hur	nidity storage I good housek	cond	itions will				uct.	
Revision N	0. 1	1 Da	te 01/12/	/07	Approved		James A.	Bertsch		Chemical Safety Coordinator	J	AB

A. Bertsch Coordinator JAB nation only as a supplement to other information gathered by ces to assure proper use of these materials and the safety and

	MATERIA	AL SAFETY	DATA SHEET	SECTION V HEALTH HAZARD DATA PP0174
LabLearner	Cognitive Learning Systems			Threshold Limited Value None established by ACGIH 2001.
The Science of Learning	240 North Third Street - Suite 1300 Harrisburg PA 17101	MSDS No.		
	www.LabLeaner.com 1.877.LEARN78	Effective D		Effects of Overexposure May be harmful by ingestion or skin absorption. May cause irritation. To
SECTION I	NAME	24 HOUR EMERG	ENCY ASSISTANCE	the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated. Exercise appropriate
	0.04% Aqueous Solution			procedures to minimize potential hazards. Target organs: None known.
Chemical Synonyms Phenol Red, V	Water Solution		-226-6177 Fire 0	Emergency and First Aid Procedures INGESTION: Call physician or Poison Control Center immediately. Induce
Formula Mixture.		. NFPA	Reactivity 0	anything by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thoroughly
Unit Size up to 3.785 Lt		HAZARD RATING MINIMAL SLIGHT MOD	HMIS * DERATE SERIOUS SEVERE	with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. SKIN: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get
C.A.S. No. Mixture.		0 1	2 3 4	medical attention. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is
SECTION II	INGREDIENTS OF		TLV Units	difficult, give oxygen. Get medical attention. SECTION VI REACTIVITY DATA
Principal Component(s	· · · · · · · · · · · · · · · · · · ·	%		Stability, Unstable Conditions to Avoid
1	sait: (CAS No. 34487-61-1)	0.04%	None established.	Stable X
Water: (CAS No. 77	/32-18-5)	99.98%	None established.	Incompatibility (Materials to Avoid) Strong oxidizers.
CAUTION!				Hazardous
MAY BE HARMFUL	IF SWALLOWED OR ABSORBED PHYSICAL DATA	D THROUGH SKIN. MA	Y CAUSE IRRITATION.	Decomposition Products Combustion may produce carbon and sulfur oxides and sodium oxide.
Melting Point (°F)	Freezes approx. 0°C (32°F)	Specific Gravity ($H_2O = 1$)	Approx. 1.00 @ 20°C.	Hazardous Polymerization Conditions to Avoid
Boiling Point (°F)	Approx. 100°C (212°F)	Percent Volatile by Volume (%)	99.96%	May Occur Will Not Occur Not applicable.
Vapor Pressure (mm Hg)	14 (water)	Evaporation Rate	<1	SECTION VII SPILL OR LEAK PROCEDURES
Vapor Density (Air=1)	0.7 (water)	(Water =1)	L	Steps to be taken in case
Solubility in Water	Complete.			material is released or spilled Absorb with an inert dry material, sweep up and place in a suitable waste container for disposal. Wash spill area with soap and water.
Appearance & Odor	Red liquid; no odor.			
SECTION IV	FIRE AND EXPLOS	ION HAZARD D		Waste Disposal Method Discharge, treatment, or disposal may be subject to Federal, State or Local laws. These disposal guidelines are intended for the disposal of catalog-size quantities only.
Flash Point (Method Used) Non-fla	mmable. Flammable Li % by Volume		Lower Upper	Dispose of in accordance with federal, state and local regulations.
Extinguisher Media Use any	v media suitable for extinguishing s	upporting fire.		SECTION VIII SPECIAL PROTECTION INFORMATION Respiration Protection None required in normal laboratory handling. If misty conditions prevail, wear a
SPECIAL FIREFIGHTING	i			(Specify Type) NIOSH/MSHA approved respirator.
PROCEDURES	In fire conditions, wea	ar a NIOSH/MSHA-appro	ved self-contained	Ventilation Local Exhaust Not required. Special No. Mechanical (General) Not required. Other No.
		and full protective clothin		Protective Gloves Rubber. Eye Protection Chemical safety glasses.
				Other Protective Equipment Goggles, smock, apron, proper gloves, eye wash station.
An-1 - An-1				SECTION IX SPECIAL PRECAUTIONS
UNUSUAL FIRE AND EXPLOSION HAZARDS				Precautions to be Taken in Handling & Storing Store in a cool, dry place. Wash thoroughly after handling. Keep container tightly closed when not in use. Store in a cool, dry place. Wash thoroughly after handling.
		er may evaporate from t		Other Precautions Read label on contellner before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.
	cause hazardous dec fume.	omposition products to b	e produced as dust or	Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing.
D.O.T. NON-REGU				Revision No. 1 Date 01/01/07 Approved James A. Bertsch Coordinator JAB
				them and must make independent determinations of suitability and completeness of information from all sources to assure properuse of these materials and line safety and

		MATERI	AL SAFET	Y DATA SHEET	SECTION V HEALTH HAZARD DATA SS0151
Labl	earne	Compline Learning Systems			Threshold Limited Value ACGIH 2001 (TLV): TWA = 10 mg/m ³ , for total dust containing no asbestos
Th	ne Science of Learni.	Cognitive Learning Systems 240 North Third Street - Suite 1300 Harrisburg, PA 17101 www.Labt.aamer.com	MSDS		and less than 1% crystalline silica; STEL 20 mg/m ³ (Dust).
		1.877.LEARN78		ve Date: January 1, 2007	Effects of Overexposure Inhalation of dust may cause irritation to lungs, eyes and mucous membranes.
SECTIO)N I	NAME	24 HOUR EME	RGENCY ASSISTANCE	Low hazard in the form of tumps. Exercise appropriate procedures to minimize potential hazards. Target organs: None known.
Product Chemical	Silicon Met	al Lumps		IEMTREC 0-424-9300 Health 0	
Synonyms	Silicon Met	al		585-226-6177 Fire 0	Emergency and First Aid Procedures
Formula	Si			Reactivity 0	anything by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thoroughly
Unit Size	up to 500 g	rams	HAZARD RATING		with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. <u>SKIN</u> : Remove contaminated clothing. Flush thoroughly with mild scap and water. If irritation occurs, get
C.A.S. No.	7440-21-3	а. А.	0 1	2 3 4	medical attention. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is
SECTIC		INGREDIENTS OF			difficult, give oxygen. Get medical attention.
Principal (Component(6)	%	TLV Units	SECTION VI REACTIVITY DATA
Silio	con metal lumps)	1009	6 See Section V.	Stability Offstable Conditions to Avoid Avoid generation of airborne dust.
					Incompatibility (Materials to Avoid) Acids and strong bases (avoid resulting fumes).
CA	UTION!				
IRE		ST. DO NOT INHALE AS DUST OF PHYSICAL DATA	R FUME.		Hazardous Decomposition Products None.
Melting Poir		1440°C (2594°F)	Specific Gravity (H ₂ O =	1) <u>2.3</u>	Hazardous Polymerization Conditions to Avoid
Boiling Poin		N/A	Percent Volatile	N/A	May Occur Will Not Occur Not applicable.
	sure (mm Hg)	N/A	by Volume (%) Evaporation Rate	N/A	SECTION VII SPILL OR LEAK PROCEDURES
Vapor Dens		N/A	(=1)		Steps to be taken in case
Solubility in		Insoluble.	· · · · · · · · · · · · · · · · · · ·		material is released or spilled Recover for use if not contaminated. Avoid creating dust. Sweep up and place in a suitable container for proper disposal. Wash spill
Appearance		Metallic silver lumps; no odor.			area with soap and water.
SECTIO		FIRE AND EXPLOS	SION HAZARD	DATA	Waste Disposal Method Discharge, treatment, or disposal may be subject to Federal, State or Local laws. These disposal guidelines are intended for the disposal of catalog-size guantities only.
Flash Point (Method Used)		Flammable I	Limits in Air	Lower Upper	Uncontaminated material may be disposed of in a sanitary landfill,
<u> </u>) NOUBAIN	% by volum			Check local codes.
Extinguisher Media	Use any	media suitable for extinguishing sup	pporting fire.		SECTION VIII SPECIAL PROTECTION INFORMATION
SPECIAL F	REFIGHTIN	G			Respiration Protection (Specify Type) None needed in normal laboratory handling. If dusty conditions prevail, work in ventilation hood or wear a NIOSH/MSHA-approved dust mask or respirator.
PROCEDU	RES				Ventilation Local Exhaust Recommended. Special No. Mechanical (General) Recommended. Other No.
				IOSH/MSHA-approved	Protective Gloves Rubber. Eye Protection Chemical safety glasses.
		self-contained breat	ning apparatus.		Other Protective Lab coat, apron, eye wash station, proper gloves, ventilation hood.
					SECTION IX SPECIAL PRECAUTIONS
UNUSUAL	FIRE AND	···· ·····			Precautions to be Taken
	N HAZARDS				in Handling & Storing Store in a cool place. Avoid inhalation of silicon dust. Keep container lightly closed when not in use. Wash thoroughly after handling.
		N/A			Other Precautions Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.
					Remove and wash contaminated clothing.
					Revision No. 4 Date 01/01/07 Approved James A. Bertsch Chemical Safety JAB
D.O.T.	NON-REGU				The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure properuse of these materials and the salety and heath of employees. These routes the salety and the salety a
Approved by U	.S. Department of	Labor "essentially similar" to form OSHA-	20		neann or employces. Trazaroous materials industrial stationaus. Frinned on recycled paper.

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87. 10% X	MATERI	AL SAFETY	DATA SHEET	SECTIO	ON V	ŀ	IEALTH HAZAI	RD DATA		SS0187
LabLearn The Science of Lear	ning 240 North Third Street - Sulte 1300 Harrisburg, PA 17101	MSDS No	.: SS0187	Threshol	d Limited V	·	None established for th netal as soluble compo			1) TWA: 0.01 mg/m ³ as silver r metal.
SECTION I Product Silver Nitrate	www.Labiearner.com 1.877.LEARN78 NAME e, 0.2 Molar Solution	Effective D	Date: August 3, 2007	Effects o	f Overexpo	[Discolors skin on conta	ct. INGESTIO	<u>N:</u> Mayb	i mucous membranes. e harmful if swallowed. otential hazards. Target
Chemical Synonyms Silver Nitrat Formula Mixture. Unit Size up to 3.785 C.A.S. No. Mixture. SECTION II	e, Water Solution Lt. INGREDIENTS OF	24-9300 Health 2 -226-6177 Fire 0 Reactivity 0 HMIS * DERATE SERIOUS 2 3 4	anything b with water <u>SKIN:</u> Re medical at	Procedures by mouth to an u for at least 15 move contamin	unconsciou minutes, li nated cloth	romiting only if advised us person. EYES: Ch fting upper and lower e ing. Flush thoroughly Remove to fresh air. If	t by appropriate eck for and ren eyelids occasion with mild soap	e medical nove cont nally. Ge and wate	Center immediately. Induce personnel. Never give act lenses. Flush thoroughly t immediate medical attention. r. If irritation occurs, get cial respiration. If breathing is	
Principal Component		%	TLV Units	SECTIO			REACTIVITY DA			- · ·
Silver nitrate: (CA		3.4%	See Section V.	Stability	Unstable Stable	X	Conditions to /			ive temperature to cause ation. Protect from light.
Water: (CAS No. 3	7732-18-5)	96.6%	None established.	Incompa (Material	tibility s to Avoid)	Whe	n dry, reducing materia rials can cause a reac		mmonium	hydroxide, alcohol and organic
CAUTION! MAY B	E HARMFUL IF SWALLOWED. IRR PHYSICAL DATA	ITANT TO SKIN, EYES ANI	MUCOUS MEMBRANES.	Hazardou Decompo	us osition Proc	lucts	Thermal decom oxides of nitrog		ces metal	lic silver, nitrogen, oxygen and
Melting Point (°F) Boiling Point (°F)	Freezes approx. 0°C (32°F) Approx. 100°C (212°F)	Specific Gravity $(H_2O = 1)$ Percent Volatile by Volume (%)	1.0-1.1 at 20°C 96.6%	Hazardous May Occu		tion ot Occur X	Conditions to A	blicable.		
Vapor Pressure (mm Hg)	·····	Evaporation Rale	<1	SECTIO			SPILL OR LEAK	PROCED	URES	
Vapor Density (Air=1)	0.7 (water)	(Water =1)			be taken in					
Solubility in Water	Complete.				is released		ed Absorb in v place in a s with soap a	uitable contain		r paper towel. Scoop up and per disposal. Wash spill area
Appearance & Odor	Clear, colorless liquid; no odor.						scharge, treatment, or dis		logt to Fail	
SECTION IV Flash Point (Method Used) Non-co	FIRE AND EXPLO	Limits in Air	Lower Upper		sposal Met		nese disposal guidelines a	re intended for the red chemical la	e disposal o	ontract an approved and
Extinguisher Media Use an	iy media suitable for extinguishing s	supporting fire.		SECTIO		S	PECIAL PROT	ECTION II	NFORM	MATION
SPECIAL FIREFIGHTIN	G			Respiration F (Specify Type	Protection	None need ventilation	ied in normal laborator hood or wear a NIOSH	y handling. If r H/MSHA-appro	misty cont ved respir	ditions prevall, work in ator.
PROCEDURES		-approved self-contained t	resthing	Ventilatio	on Local Ex Mechani	haust cal (Genera	Not required.	Special Other		No. No.
	apparatus and full prot	ective clothing to prevent	contact with skin	Protectiv	e Gloves		Rubber.	Eye Prote	ction	Chemical safety glasses.
	and eyes. Use floodin	g amounts of water in earl	y stages of fire.	Other Protect Equipment	ive Go	oggles, sm	ock, apron, proper glov	ves and eye wa	ash statior	1.
				SECTIC	DN IX	8	SPECIAL PREC	AUTIONS		
UNUSUAL FIRE AND EXPLOSION HAZARDS				in Handling	to be Taken g & Storing htty closed when not in	use. (Store in a cool place ar combustible material.	Wash thorough	lly after ha	andling.
		r may evaporate from this mposition products to be p		Other Prec	Avo					nicals. n. hing. Remove and wash
		· · · ·		Revision N		te 08/03		James A.		Chemical Safety JAB
D.O.T. NON-REGU				them and must ma	ake independent detern	ninations of sult	tranty of any kind. Employers sh ability and completeness of Infor- tandards. Printed on recycled pa	nation from all sources	ion only as a s s to assure pro	upplement to other information gathered by operuse of these materials and the safety and
Approved by 0.5. Department 0	f Labor "essentially similar" to form OSHA	1-20						• • •		

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	MATERI	AL SA	FETY	DATA SHEET	SECTIO	NV		HEALTH HAZA	RD DAT	A		SS0430
Lablearne The Science of Learn				000400	Threshold	Limited	Value	None established. RT mg/kg. No published o	ECS No. V lata indicati	Z4725000 To ing salt is a h	oxicity data: LD50 azardous materia	Orl-rat 300 to handle.
SECTION I	www.Lableaner.com 1.877.LEARN78	24 HOU		A: SS0430 Date: February 13, 2008 GENCY ASSISTANCE	Effects of	Overexp		EYES AND SKIN: Co long period of time, res (more than 0.1 pound)	ults in dehy may cause	dration. <u>ING</u> vomiting. <u>IN</u>	ESTION: Of larg	e amounts It leaves tas
Product Sodium Ch	loride			ATREC Health 1				with mild irritation to m None known.	ucous meir	iorarie in nos	e and throat. Tar	get organs:
Chemical Synonyms Common S	alt; Rock Salt			24-9300 Health 1 5-226-6177 Fire 0	Emergen				sisten en D	-i	0 + mit + - i = +	
Formula NaCl	<u> </u>		х х	Reactivity 0	First Aid			INGESTION: Call phy vomiting only if advise	d by approp	priate medical	I personnel. Neve	rgive
Unit Size up to 180 K			RATING	HMIS*	with water	for at least 1	5 minutes,	ous person. EYES: Ch lifting upper and lower	eyelids occa	asionally. Ge	et immediate medi	cal attention
C.A.S. No. 7647-14-5		- MINIMAL 0	зыент мо 1	DERATE SERIOUS SEVERE				hing. Flush thoroughly Remove to fresh air. I				
SECTION II	INGREDIENTS OF	MIXTUR	ES		difficult, giv	ie oxygen. (et medical	attention.		ing, give and		. oroaaning i
Principal Component	(s)		%	TLV Units	SECTIC			REACTIVITY D				
Sodium chloride			100%	None established.	Stability	Unstable Stable	x	Conditions to	Avola	Wet conditi corrosion.	ions can cause ca	king and/or
					Incompat			trolysis can produce cl	lorine gas.		ided the salt is dry	r.
LOW HAZARD FOR US	UAL LABORATORY HANDLING; N	ON-TOXIC.			(Materials	s to Avoid	l) Con	centrated acid such as				
					Hazardou Decompo	_	oducts	Electrolysis car	n produce c	hlorine gas.		
	PHYSICAL DATA	Specific Gravity			Hazardous			Conditions to	Avoid			
Melting Point (°F)	804°C (1479°F)	Percent Volatile	$(\Pi_2 O = 1)$	2.163 at 25°C	May Occu	r Will	Not Occur			Not applica	able.	
Boiling Point (°F)	1413°C (2575°F)	by Volume (%) Evaporation Rat	6	Negligible as solid.	RECTIO	M MH	х	SPILL OR LEAI			N	
Vapor Pressure (mm Hg		(=1)		Non-volatile.	SECTIO Steps to I				(Proc	EDURES	5	
Vapor Density (Air=1)	Not listed.				material i			led Sweep up ar	d place in a	a suitable con	ntainer. Sweep up	and flush
Solubility in Water	1 gram dissolves in 2.8 mL. wat							with water.	lo special h	nazards conne	ected with leaks o	r spills.
Appearance & Odor SECTION IV	White crystals, granular or power FIRE AND EXPLO				Waste Dis	enosal Ma	thod	Discharge, treatment, or dis	posal may be	e subject to Fed	jeral, State or Local I	aws.
Flash Point (Method Used) Not flam	Flammable	Limits in Air		Lower Upper				These disposal guidelines a Dry landfill or dissolve i quality standards.		,		
Extinguisher Media Use any	media suitable for extinguishing sur	porting fire.			SECTIO	N VIII		SPECIAL PRO1	ECTIO		MATION	
				<u></u>	Respiration P (Specify Type)	rotection	None shou	ld be needed in norma hood or wear a NIOSH	laboratory	use. If dusty	conditions preval	l, work in
SPECIAL FIREFIGHTIN PROCEDURES	NG					I and	Exhaust	Yes, if dusty.	Spec		No.	
······································				apply. In fire conditions, d breathing apparatus		Mecha	nical (Gene		Othe		No.	
	and eye protection.	A-approved se	n-comaine	o breatning apparatus	Other Protective			None needed.	⊨ye Pr	otection	Chemical sa	fety glasses
					Equipment	Lab		wash station.				
					SECTIO			SPECIAL PREC	AUTIO	NS		e de la las
					Precaution: in Handling Keep container tight	& Storing		Store in a dry place wi deliquescence. Wash				
	5											
UNUSUAL FIRE AND EXPLOSION HAZARD	S When sodium chlorid emitted which is irrita				Other Preca	autions Fo	ad label on conta r laboratory use	ainer before using. Do not wear or only. Not for drug, food or househ	ontact lenses whe old use. Keep or	en working with che ut of reach of childre	emicals. en,	
	When sodium chlorid				Other Preca			ainer before using. Do not wear ci only. Not for drug, food or househ sually not necessary ui				
	When sodium chlorid				Other Preca	G	loves are u		nless open			JAB

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		MATERI	AL SA	FETY	DATA SHEET	SECTION V	·	Н	EALTH HAZARD DA	TA	SS05	78
	Learne	Cognitive Learning Systems		MSDS		Threshold Lim	ited Va		one established for this solutio	n. (ACGIH 2001)	
		www.labLeamer.com 1.877.LEARN78			ve Date August 25, 2008	Effects of Ove	rexpos	ure				
SECTIO	ONT	NAME	24 HOU		GENCY ASSISTANCE	membranes of th	e mouth, t	hroat and	IGESTION: Severe burns and stomach. SKIN AND EYES:	complete tissue Contact with ski	perforation of mucc in or eyes may caus	ous se severe
Product	1	oxide, 0.005 Molar Solution (0.005N				irritation or burns	INHALA	TION: E	xposure can produce burns of t et organs: Respiratory and gas	the respiratory tra	act. Severe exposu	ire could
Chemical		oxide, Water Solution	$\frac{9}{3}$	<u> </u>	1TREC Health 2	Emergency an	nd	<u> </u>				
Synonyms	· · · ·		- 🏷	Day 710	6-226-6177 Fire 0	First Aid Proc			IGESTION: Call physician or F			
Formula	Mixture.		_ NFF	PA	Reactivity 1 HMIS *			consciou	omiting only if advised by appro s person. <u>EYES:</u> Check for an	nd remove contac	ct lenses. Flush tho	oroughly
Unit Size	up to 3.785 L	t.	— MINIMAL	D RATING SLIGHT MO	DERATE SERIOUS SEVERE				ing upper and lower eyelids oc ig. Flush thoroughly with mild :			
C.A.S. No.			0	1	2 3 4		INHALA	TION: R	emove to fresh air. If not breat			
SECTIO Dringing		INGREDIENTS OF	MIXIUH	1 13 %	TLV Units	SECTION V		·	EACTIVITY DATA			
	Component(table	14	Conditions to Avoid	Deliquescent m	naterial. Can slowly p	pick up
Sodium hyd	droxide: CAS No	o. 1310-73-2		0.02%	TWA: C 2 mg/m ³	Sta	able	х		to form sodium	air and react with cart I carbonate.	Don dioxide
Water: CA	S No. 7732-18-5	5		99.98%	N/A	Incompatibilit (Materials to A		Metal	s, acids, organic halogen comp	oounds, organic i	nitro compounds.	
DANGER!	CORROSIVE!						woiu)		I			
		ED. CAUSES BURNS TO SKIN AN PHYSICAL DATA	d eyes. D		LE AS DUST OR MIST.	Hazardous Decompositio	n Produ	ıcts	Sodium oxide. Decomp releases flammable and			als
Melting Pol		0°C (32°F)	Specific Gravit	y(H ₂ O ≕ 1)	~ 1.1	Hazardous Poly	merizati	on	Conditions to Avoid	<u></u>		
Boiling Poi		~ 100°C (212°F)	Percent Volatil	0	99.98%	May Occur	Will Not			Not applica	ible.	
<u> </u>	ssure (mm Hg)	14 (water)	by Volume (%) Evaporation Re		<1	SECTION V	X		PILL OR LEAK PRO	CEDURES		· · ·
	sity (Air=1)	0.7 (water)	(=1)			Steps to be ta		_				
Solubility in		, ,				material is rele	eased o	r spille	d Wearing protective cl material, sweep up ar			
Appearanc		Complete.	<u></u>						Wash spill area with s			
SECTIO		Clear, colorless liquid; no odor.	SION HA	ZARDD	ΑΤΑ	Waste Dispos	al Meth		scharge, treatment, or disposal may			
Flash Point		Flammable	Limits in Air	V/A	Lower Upper	i			ese disposal guidelines are intended		•	•
(Method Used	/	ammable. % by Volum	ne i		I			D	spose of in accordance with all	tederal, state an	id local regulations.	
Extinguisher Media	Use wa	ater spray on fire involving this mate	rial.			SECTION V		S	PECIAL PROTECTIC	N INFORM	ATION	
SPECIAL	I FIREFIGHTIN	G				Respiration Protection (Specify Type)		one requ	ired in normal laboratory handli particulate respirator.	ng. If misty cond	ditions prevail, use a	a high
PROCEDU		In fire conditions, wear				Ventilation	Local Exha			ectal	No.	
		breathing apparatus a complete eve protectio			 Must include ng care not to splatter or 	Protective Glo					No. Chemical safety go face shield where a	oggles, or
		splash this material.			-	Other Protective						opropriate
						Equipment SECTION IX			pat, apron, ventilation hood, pro		wash station.	
		PONSE GUIDEBOOK, RSPA P 580	0.9, GUIDE	PAGE NO. 1	(54)	Precautions to b						
	- FIRE AND ON HAZARDS					in Handling & Sto Keep container tightly closed	<u> </u>	⊔ s	tore in a cool, dry place. Produ ubstances. Avoid contact with void inhalation of vapor or spra	skin, eyes and cl	lothing. Do not take	i other e internally
		In fire conditions, wate cause hazardous dec			is solution, which may e produced as dust or	Other Precaution	Read lat For labo	el on contain ratory use ont	er before using. Do not wear contact lenses w y. Not for drug, food or household use. Keep	hen working with chemic out of reach of children.	cals.	
		fume. Contact with m	ost metals ca	an generate	hydrogen gas. A severe troys tissue on contact.		Sodiu	m hydrox	ide and trichloroethylene are e	specially hazard	ous since they reac	et to
		eye hazaru, sono of ci	oncesti dieu :	Solution des	abys ussue on contact.		form e reuse		ously flammable dichloroacetyk	ane. Wash conta	aminated clothing be	efore
						Revision No.	1 Date	08/28	5/08 Approved Jam	tes A. Bertsch	Chemical Safety Coordinator	JAB
D.O.T.		droxide solution, 8, UN1824, PG II		Lt.		The information contained he them and must make independent of employees at User	erein is furnishe endent determin ardous Material	ed without war ations of suita	ranty of any kind. Employers should use this ibility and completeness of information from al andards. Printed on recycled paper.	information only as a sup I sources to assure prop	plement to other information eruse of these materials and	gathered by the safety and
Approved by l	U.S. Department of	Labor "essentially similar" to form OSHA-	-20			nearan os emproyeea. Haza			anaalaa Timisa ah rooyolda popula			

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	MATERI	AL SAFETY	DATA SHEET								
Lab Learne	9 240 North Third Street - Suite 1300 Harrisburg, PA 17101	MSDS	No. SS0600	Threshold Limited Value None established for this solution. (ACGIH 2001)							
OFOTION	www.LabLeamer.com 1.877.LEARN78	Effecti	ve Date January 1, 2007	Effects of Overexposure membranes of the mouth, throat and stomach. <u>SKIN AND EYES</u> : Contact with skin or eyes may cause s							
SECTION I	NAME	24 HOUR EMER	GENCY ASSISTANCE	irritation or burns. INHALATION: Exposure can produce burns of the respiratory tract. Severe exposure could result in chemical pneumonia. Target organs: Respiratory and gastrointestinal tracts, eyes, skin.							
Chemical	oxide, 0.1 Molar Solution (0.1N)	̄ I 〈 '〈 800-/	MTREC #24-9300 Health 2								
	oxide, Water Solution	- 3 1 Day 71	6-226-6177 Fire 0	Emergency and First Aid Procedures INGESTION: Call physician or Poison Control Center immediately. Induce							
Formula Mixture.		NĚPA	Reactivity 1 HMIS *	womiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention. SKIN: Remove contaminated clothing. Flush thoroughly with mild scap and water, If irritation occurs, get							
Unit Size up to 3.785 L C.A.S. No. Mixture.	[DDERATE SERIOUS SEVERE								
C.A.S. No. Mixture.	INGREDIENTS OF		2 3 4	medical attention. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.							
Principal Component(%	TLV Units	SECTION VI REACTIVITY DATA							
Sodium hydroxide: CAS No	o. 1310-73-2	0.4%	TWA: C 2 mg/m ³	Stability Unstable Conditions to Avoid Deliquescent material. Can slowly pick up moisture from air and read with carbon dioxid to form softeneste.							
Water: CAS No. 7732-18-5	;	99.6%	N/A	Incompatibility							
DANGER! CORROSIVE!				(Materials to Avoid) Metais, acids, organic halogen compounds, organic nitro compounds.							
HARMFUL IF SWALLOWE	D. CAUSES BURNS TO SKIN A	ND EYES. DO NOT INH	ALE AS DUST OR MIST.	Hazardous Sodium oxide. Decomposition by reaction with certain metals							
SECTION III	PHYSICAL DATA			Decomposition Products releases flammable and explosive hydrogen gas.							
Vielting Point (°F)	0°C (32°F)	Specific Gravity (H ₂ O = 1) Percent Volatile	~ 1.1	Hazardous Polymerization Conditions to Avoid May Occur Will Not Occur							
Boiling Point (°F)	~ 100°C (212°F)	by Volume (%)	99.6%								
/apor Pressure (mm Hg)	r Pressure (mm Hg) 14 (water)		<1	SECTION VII SPILL OR LEAK PROCEDURES Steps to be taken in case							
Vapor Density (Air=1)	0.7 (water)			material is released or spilled Wearing protective clothing, absorb spill with an inert dry							
Solubility in Water	Complete.			material, sweep up and place in a suitable container for disposal. Wash spill area with soap and water.							
Appearance & Odor SECTION IV	Clear, colorless liquid; no odor. FIRE AND EXPLO	SION HAZARD		Waste Disposal Method Discharge, treatment, or disposal may be subject to Federal, State or Local laws.							
Flash Point		Limits in Air	Lower Upper								
Extinguisher				Dispose of in accordance with all federal, state and local regulations.							
Media Use wa	ater spray on fire involving this mate	erial.		SECTION VIII SPECIAL PROTECTION INFORMATION							
SPECIAL FIREFIGHTIN	G			Respiration Protection (Specify Type) None required in normal laboratory handling. If misty conditions prevail, use a high efficiency particulate respirator.							
PROCEDURES		ar a NIOSH/MSHA-appro and full protective clothing		Ventilation Local Exhaust Recommended Special No. Mechanical (General) Recommended Other No.							
	complete eye protecti splash this material.	ion. Flood with water, us	ing care not to splatter or	Protective Gloves Rubber. Eye Protection Chemical safety goggles, or face shield where appropriate							
				Other Protective Equipment Goggies, lab coat, apron, ventilation hood, proper gloves, eye wash station.							
(2004 EMERGENCY RESP	ONSE GUIDEBOOK, RSPA P 58	00.9, GUIDE PAGE NO.	154)	SECTION IX SPECIAL PRECAUTIONS							
JNUSUAL FIRE AND EXPLOSION HAZARDS				Precautions to be Taken in Handling & Storing Keep container tightly closed when not in use. Store in a cool, dry place. Product can react violently with acids and other substances. Avoid contact with skin, eyes and clothing. Do not take internal Avoid inhalation of vapor or spray. Wash thoroughly after handling.							
		ter may evaporate from the		Other Precautions Read label on container before using. Do not wear contact lenses when working with chemicals. For laboratory use only. Not for drug, food or household use. Keep out of reach of children.							
cause hazardous decomposition products to be produced as dust o fume. Contact with most metals can generate hydrogen gas. A se eve hazard, solid or concentrated solution destroys tissue on conta				Sodium hydroxide and trichloroethylene are especially hazardous since they react to							
			trova ticovo on contact	Socium nyuroxide and inchiordentylene are especially hazardous since mey react in							
			troys tissue on contact.	form spontaneously flammable dichloroacetylene. Wash contaminated clothing before reuse.							
			troys tissue on contact.	form spontaneously flammable dichloroacetylene. Wash contaminated clothing before							

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m a a		AL SAFETY	DATA SHEET	SECTION V	H	EALTH HAZAR	D DATA	SS1085		
Lab Learne The Science of Learn	hing Harrisburg, PA 17101	MSDS N	o.: SS1085 SS1090	Threshold Limited Va	alue N	one established. TLV:	10 mg/m ³ (total dusi) or 5 mg/m ³ (respirable dust).		
SECTION I Product Sulfur	www.Lablearner.com 1.877.LEARN78	Effective 24 HOUR EMER	Date: January 1, 2007 GENCY ASSISTANCE	Effects of Overexpos		Sulfur is essentially non-toxic either through ingestion, inhalation or skin contact. There are, however, some individuals who may be allergic and must not be permitted in the area of exposure. Sulfur is an eye irritant, but if prom treatment is applied no lasting injury will result. Target organs: None known.				
Formula S	Sulfur Flower, Sulfur Flour, Roll Ia S ze up to 2.5 Kg. No. 7704-34-9		24-9300 Health 1 5-226-6177 Fire 1 Reactivity 0 HMIS * DDERATE SERIOUS 2 3	Emergency and First Aid Procedures anything by mouth to an unconscious person. <u>EYES:</u> Check for and remove contact lenses. Flus with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate med <u>SKIN</u> : Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occ medical attention. <u>INHALATION</u> : Remove to fresh air. If not breathing, give artificial respiration. difficult, give oxygen. Get medical attention.						
Principal Component Sulfur		%	TLV Units	SECTION VI Stability Unstable	R	EACTIVITY DAT	ald	oarks, open flames		
		100%	See Section V.	Incompatibility			xidizing agents. Co	er heat sources. rrosive to copper and copper		
WARNING! FLAMMAE	LE SOLIDI BURNING SULFUR EM	ITS HIGHLY TOXIC FU	NES. SULFUR DUST	(Materials to Avoid)	alloys	. Damp sulfur will corro	de steel.	Nin ma		
SUSPENDED IN AIR IG	INITES EASILY. MAY CAUSE ALLE PHYSICAL DATA	ERGIC REACTION.		Hazardous Decomposition Prod	ucts	Sulfur dioxide.				
Melting Point (°F)	116°-121°C (242°-251°F)	Specific Gravity $(H_2O = 1)$	2.04-2.07 @ 21°C (70°F)	Hazardous Polymerizat		Conditions to A	oid	······································		
Boiling Point (°F)	444°C (831°F)	Percent Volatile by Volume (%)	Negligible.	May Occur Will No	pplicable.					
Vapor Pressure (mm Hg		Evaporation Rate	N/A	SECTION VII SPILL OR LEAK PROCEDURES						
Vapor Density (Air=1)	N/A	(=1)		Steps to be taken in case						
Solubility in Water	material is released or spilled oreating dust in air and accumulation on surfaces from spills or laboratory operations. Sweep up and place in a suitable container for reclamation or disposal in an approved facility.									
Appearance & Odor	Yellow powder, crystals or rolls (bi		00	Wester Discussed Mark	Die	for reclamatio charge, treatment, or dispo	•	· · · · · · · · · · · · · · · · · · ·		
SECTION IV	FIRE AND EXPLOS		Lower Upper	Waste Disposal Meth		ese disposal guidelines are	intended for the dispos	al of catalog-size quantities only.		
	C (405°F) (C.C.) % by Volum	3.3 46.0	Dispose of in an approved sanitary landfill after mixing 3 parts by weight of calcium carbonate to neutralize the slow generation of sulfuric acid.							
Extinguisher Media Use v	vater fog.			SECTION VIII		PECIAL PROTE				
				Respiration Protection N	nne shoulr	he needed in normal (aboratory handling	If dusty conditions prevail work		
SPECIAL FIREFIGHTIN PROCEDURES	1	a MIOSH/MSHA approv	ed self-contained	(Specify Type) in Ventilation		d or wear a NIOSH/MSI Recommended.	A-approved respire Special	No.		
	Mechanic	al (General		Other	No.					
	straight streams which may be extinguished wi		Protective Gloves		Rubber.	Eye Protection	Chemical safety glasses/goggles.			
	not cooled below 154°C		Other Protective Equipment Sm	ock, apron	, eye wash station, ven	hood, fire extinguis	her.			
(2004 EMERGENCY RES	PONSE GUIDEBOOK, RSPA P 5800	.9, GUIDE PAGE NO. 1	33)	SECTION IX		PECIAL PRECA	UTIONS			
UNUSUAL FIRE AND EXPLOSION HAZARD	S Easily ignitible, combus mixtures with air. Haza forming explosive mixtu	idizing materials,	Precautions to be Taken in Handling & Storing Store in a cool, dry, well-ventilated area away from heat, sparks, flames and oxidizing agents. Avoid creating dust. All electric motors in sulfur working area should be of the explosive proof type. Wash thoroughly after handling.							
	of dust, when exposed	to flames. Dangerous w kides of sulfur; can react	hen heated it emits	Other Precautions Read label on container before using. Do not wear contact tenses when working with chemicals. For laboratory use only. Not for drug, tood or household use. Keep out of reach of children. Avoid contact with skin and eyes. Avoid breathing dust. Use with adequate ventilation. Use non-ferrous tools to reduce sparking. Remove and wash contaminated clothing before						
	Autoignition Temperatu	ıre: 248°C (478°F).		reus	-			Chamical Patett		
D.O.T. Suifur, 9, N	A1350, PG III				ed without warr		James A. Bertsol d use this information only as			
	of Labor "essentially similar" to form OSHA-	20		them and must make independent determine health of employees. * Hazardous Materia	nations of sulta Is industrial Sta	bility and completeness of informat indards. Printed on recycled papel	on from all sources to assure	a supplement to other information gathered by proper use of these materials and the safety and		

MATERIAL SAFETY DATA SHEET								SECTION V HEALTH HAZARD DATA SS1121							
LabLea	arne	Comitive Learning Syste	ms						d Limited V		one established for th	is mixture. (ACG	ilH 2001)		
	The Science of Learning 240 North Third Street - Suite 1300 Harrisburg, PA 17101 MSDS No : SS1121						Effects of Overexposure Ingestion may cause irritation and/or burns to the entire gastrointestinal tract,								
www.LabLearner.com 1.877_LEARN76 Effective Date: January 1, 2007							including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding and/ or tissue ulceration. Contact with skin or eyes can cause severe irritation and/or burns. Repeated inhalation may								
SECTION I	SECTION I NAME 24 HOUR EMERGENCY ASSISTANCE								cause irritation and/or burns to the nose, throat and lungs and also etching of dental enamel followed by the						
Product Sul	lfuric Acid	cid, 0.5 Molar (1.0N) Solution							erosion of the enamel and dentine with loss of tooth substance. Exercise appropriate procedures to minimize potential hazards. Target organs: Respiratory system, skin, eyes, teeth.						
Chemical Synonyms Sul					0 800-424-9300 Health 2 Day 585-226-6177 Fire 0			Emergency and							
Formula Mix	A Mixture.							First Aid Procedures INGESTION: Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give							
Unit Size up	to 3.785 L				ARD RATING HMIS*			anything by mouth to an unconscious person. EYES: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.							
C.A.S. No. Mix	MINIMAL SLIGHT MODERATE SERIOUS SEVERE							SKIN: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention. <u>INHALATION:</u> Remove to fresh air. If not breathing, give artificial respiration. If breathing is							
SECTION II INGREDIENTS OF MIXTURES									e oxygen. Get			not breathing, gr	ve artificiar i	espiration. It breathing is	
Principal Comp	conent(s	5)			%	TL۱	/ Units	SECTIO	N VI	R	EACTIVITY DA		· · .		
Sulfuric a	acid: CAS	No. 7664-93-9			2.62%	TWA:1 mg/	/m ³ STEL: 3 mg/m ³	Stability	Unstable Stable	x	Conditions to A		xcessive ter vaporation.	mperature to cause	
Water: C/	AS No. 77	32-18-5			97.38%	None esta	ablished.	Incompat			es, amines, anhydrid				
WARNIN	GI CORF	ROSIVE!						(Materials to Ávoid) metals.						uxidizers, powdered	
HARMFUL IF SWALLOWED. MAY CAUSE BURNS.								Hazardous Decomposition Products Thermal decomposition or combustion may produce sulfur trioxide and/or sulfur dioxide. Hydrogen gas by reaction with metals.							
SECTION III		PHYSICAL	_ DATA	1. ·		: `		·····			sulfur dioxide. H		eaction with	metals.	
Melting Point (°F))	~ 0°C (32°F) Specific Gravity			$(H_2O = 1) \sim 1.0$			Hazardous Polymerization Conditions to Avoid May Occur Will Not Occur							
Boiling Point (°F)	Point (°F) ~ 100°C (212°F) Percent Votatil by Votume (%)			Percent Volatile by Volume (%)											
Vapor Pressure (r	por Pressure (mm Hg) 14 (water) Evaporation Ra (Water =1			1 - 1			SECTION VII SPILL OR LEAK PROCEDURES								
Vapor Density (Ai	ir=1)	0.7 (water)						Steps to be taken in case material is released or spilled Carefully neutralize with soda ash or lime and cover with inert dry							
Solubility in Water Complete.										place in suitable		or disposal. Wash spill area			
Appearance & Odor Clear colorless liquid; no odor.															
SECTION IV FIRE AND EXPLOSION HAZARD DATA Flash Point Flammable Limits in Air Lower Upper							Waste Dis	sposal Meth	nod Dis	charge, treatment, or disp ase disposal guidelines ar	e intended for the c	t to Federal, 8 lisposal of cata	State or Local laws. alog-size quantities only.		
(Method Used)	Non-f	ammable.	% by Volume							Di	spose of in accordanc	e with federal, st	ate and loca	al regulations.	
Extinguisher	lf invo	lved in a fire use wate	r sprav					SECTIO	N VIII -	e	PECIAL PROT			TION	
Media If involved in a fire, use water spray.								Respiration P	rotection	None need	ed in normal laborator	y handling. If m	istv conditio	ns prevail, work in	
SPECIAL FIREFI PROCEDURES	SPECIAL FIREFIGHTING							(Specify Type)	L L Free		hood or wear a NIOSH Recommended		ed respirator	r No.	
Wear a NIOSH/MSHA approved self-contained, positive pressure								Ventilatio		al (General	and the second se			No.	
breathing apparatus, full firefighting protective clothing and eye protection.							Protective	Gloves		Rubber.	Eye Protect	tion (Chemical safety goggles.		
							Other Protection Equipment		shield, pro	pper gloves, lab coat a ty shower.	nd apron, ventila	tion hood, e	mergency eye wash		
(2004 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.9, GUIDE PAGE NO. 157)							SECTIO	NIX		PECIAL PREC	AUTIONS				
							Precautions in Handling	to be Taken & Storing	S	tore in a cool, dry, well			e internally.		
	EXPLOSION HAZARDS Contact with reactive metals, e.g. aluminum may result in the								tly closed when not in		void contact with skin,	-			
		generation of	f flammable hy	drogen gas	Fire or exc	cessive heat		Other Preca	utions Read la For lab	abel on containe oratory use only	r before using. Do not wear con . Not for drug, load or househol	tact lenses when working d use. Keep out of react	g with chemicals. of chlidren.		
produce hazardous decomposition products. May react vigorously with alkali materials.									Lise	with adequ	late ventilation Rem	we and wash co	ntaminated	clothing	
Use with adequate ventilation. Remove and wash contaminated clothing.											oloaning,				
								Revision N		e 01/01		James A. Be	ertsch	Chemical Safety JAB	
D.O.T. Sulfuric acid, 8, UN2796, PG II, Ltd Qty - 1 Lt. Approved by U.S. Department of Labor "essentially similar" to form OSHA-20								The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. Hearafous Metarials industrial Standards. Printed on recycled paper.							
Approved by 0.5. Depa	arunent of L	abor essentially similar t	o iorm OSHA-20)				notian or employees	~ I IOCO OVO MOLEIIE	maaantai Ok	noonaan kinnoo urreeyelee pap				

Labl earn	MAIER	IAL SAFETY	DATA SHEET	SECTION V	HEALTH HAZARD DATA ZZ0015
	New F Cognitive Learning Systems			Threshold Limited Value	
The overlee of Lee	Hanisburg, PA 17101 www.LabLeamar.com 1.877.LEARN78	MSDS N			None established (ACGIH 2001).
OFOTION		Effective	Date: January 1, 2007	Effects of Overexposure	INHALATION OF FUMES: When heated above 400°C, inhalation of the
SECTION I	NAME	24 HOUR EMER	GENCY ASSISTANCE		lunies may lead to metal tume fever. Mild to severe symptoms of obility and
Product Zinc Meta	u/	Снеі			fever, profuse perspiration, weakness, nausea, vomiting and coughing can occur. <u>EYES:</u> May cause eye irritation. <u>SKIN:</u> Prolonged or repeated skin
Synonyms Mossy, G	ranular, Shot	800-4	24-9300 Health 0		contact may cause skin irritation. Target organs: None known.
Formula Zn				Emergency and First Aid Procedures	INGESTION: Call physician or Poison Control Center immediately. Induce
Unit Size up to 2.5 I	≺g,	HAZARD BATING	Reactivity 2 HMIS *	anything by mouth to an unconscio	Volining only if advised by appropriate medical personnel. Never give
C.A.S. No. 7440-66-6		MINIMAL SLIGHT MC	DERATE SERIOUS SEVERE	the nate of alleast to thinkes.	lifting upper and lower eyelids occasionally. Get immediate medical attention. hing. Flush thoroughly with mild soap and water. If irritation occurs, get
SECTION II	INGREDIENTS OF	· ·	2 3 4	Incordination INTALATION:	Remove to tresh air, it not breathing give artificial recontration. It has all the
Principal Componer		%	TLV Units	difficult, give oxygen. Get medical SECTION VI	Attention. REACTIVITY DATA
Zinc metal		99%	None established.	Stability Unstable	Conditions to Asset 1
			None established.	Stability Stable X	Ensective temperature and heat. Hydrogen may
CAUTION! USE CARE	IN HANDLING - ABRASIVE TO SKI			Incompatibility (Materials to Avoid)	trong oxidizers, acids, alkalies.
	TO LIBERATE HYDROGEN GAS - A			Hazardous	
SECTION III	PHYSICAL DATA		EUSIVE GAS.	Decomposition Products	Oxides of zinc may be present. Zinc tumes.
Melting Point (°F)	419°C (787°F)	Specific Gravity $(H_2O = 1)$	7.12	Hazardous Polymerization	Conditions to Avoid
Boiling Point (°F)	907°C (1665°F)	Percent Volatile by Volume (%)	Not applicable.	May Occur Will Not Occu	Not applicable.
Vapor Pressure (mm Hg) Not applicable.	Evaporation Rate (=1)	Not applicable.	SECTION VII	SPILL OR LEAK PROCEDURES
Vapor Density (Air=1)	Not applicable.			Steps to be taken in case	OF ILL ON LLAK PROCEDURES
Solubility in Water	Insoluble.	······································	·····	material is released or spi	
Appearance & Odor	Silvery metal mossy, granular, sh	iot: no odor.			place in a suitable container for disposal.
SECTION IV	FIRE AND EXPLO		ATA	Waste Disposal Method	Discharge, treatment, or disposal may be subject to Federal, State or Local laws.
Flash Point (Method Used) Non-fla	mmable. Flammable % by Volum	Limits in Air	Lower Upper		increase disposal guidelines are interided for the disposal of catalog-size quantities only.
					Dispose of in an approved chemical landfill or contract with a licensed waste disposal service.
	r with dry sand, earth or soda ash, dr T USE WATER ON MOLTEN MATER	'y powder. RIAL,		SECTION VIII	SPECIAL PROTECTION INFORMATION
SPECIAL FIREFIGHTIN	IG		<u></u>	Respiration Protection None ner	eded in normal laboratory handling. If dusty conditions prevail, wear a NIOSH/ pproved dust mask or work ia adequate ventilation hood.
PROCEDURES				Ventilation Local Exhaust	Recommended. Special No.
	In fire conditions, wea	ar a NIOSH/MSHA-appro	/ed self-contained	Mechanical (Gene	eral) Recommended. Other No.
	breathing apparatus. causing "fume fever".	When heated, the fumes	are highly toxic,	Protective Gloves Suita Skin	irritation. Eye Protection Chemical safety glasses.
				Equipment Smock, apro	n, eye wash station, proper gloves, goggles, ventilation hood.
UNUSUAL FIRE AND		<u> </u>			SPECIAL PRECAUTIONS
EXPLOSION HAZARDS	3			Precautions to be Taken in Handling & Storing	Store in a cool, dry, ventilated place. Separate from acids,
] Bulk dust in contact w	vith water or damp air evo	ves bydrogen. The heat	Keep container lightly closed when not in use.	halogenated hydrocarbons and strong alkali hydroxides.
	produced during this r	reaction could ignite the h this happens in confined	vdrogen An explosive	Other Precautions Read label on cont For laboratory use	ainer before using. Do not wear contact lenses when working with chemicals. only. Not for drug, food or household use. Keep out of reach of children.
	explosive mixture in a	ir. Zinc oxide fume may r	esult from combustion of		
	Zinc dust.			Wash thoroug	ghly after handling. Remove and wash contaminated clothing.
<u></u>				Revision No. 12 Date 01/0	1/07 Approved James A. Bertsch Chemical Safety JAB
D.O.T. NON-REGUI	LATED.	······		The information contained herein is furnished without withem and must make independent determinations of se	Approved James A. Bertsch Coordinator JAB warranty of any kind. Employers should use this information only as a supplement to other information gathered by uitability and completeness of information from all sources to assure proper use of these materials and the safety and Standards. Printed on recycled paper.
	occonticaty on take to toriti USHA-2			meanin of employees. * Hazardous Materials Industrial	Standards. Printed on recycled paper.

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Conditions for safe storage, including any incompatibilities:

Store away from incompatible materials. Protect from freezing and physical damage. Keep away from food and beverages. Provide ventilation for containers, Avoid storage near extreme heat, ignition sources or open flame. Store in cool, dry conditions in well sealed containers, Store with like hazards.

SECTION 8: Exposure controls/personal protection

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sea.

Control Parameters:

7440-21-3, Silicon, TWA 10 mg/m3 USA, OSHA - TABLE Z-1 Limits for Air Contaminants - 1910,1000.

Odor threshold:

Meiting/Freezing point

Boiling point/Boiling range:

Flash point (closed

Evaporation rate:

Flammability (solid, gaseous):

pH-value

cup)

Not determined

lot Determined

lot determined

Not determined

Melting point/range: 1,410 °C (2,570 °F) - lit.

2,355 °C (4,271 °F) - lit

The substance or mixture i a flammable solid with the category 2

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. Vapor density:

Relative density:

Auto/Self-Ignition temperature:

Decomposition

temperature:

Viscosity

Partition coefficient (not contained and con

50]ubilities

Not determined

Not determined

Not determined

a. Kinematic: Not

b. Dynamic: Not

etermined

determined

2.33 g/mL at 25 °C (77

Molecular Weight: 28,09

400 °C (> 752 °F)

4

Page 5 of 8 Sulfuric Acid, 1,0N

Effective date : 12,05,2014 Possible hazardous reactions:

Reacts violently or explosively with incompatibles. Reacts with most metals to produce hydrogen gas, which may form explosive mixtures with air.

Conditions to avoid:

S 11

Store away from incompatible substances, excess heat.

incompatible materials:

Organics. Metals, Strong acids, Strong bases. Alcohols, Chlorine, halogenated compounds. Combustible materials. Chlorates, Alkalines, Carbides. Fulminates. Reducing agents. Nitrates. Acetic acid. Oxidizing agents,

Haza rdous decomposition products

Oxides of sulfur, Carcinogenic mists/aerosols, Oxygen.

SECTION 11: Toxicological informati	in a state of the
	E

Acute Toxicity:		
Oral: 7664-93-9		LD50 Rat: 2140 mg/kg
Inhalation: 7664-93-9		LD50 Rat: 510 mg/m3 - 2h
Chronic Toxicit	y:	
Inhalation:		Repeated exposure may cause bronchitis to develop with coughing, phlegm, and/or shortness of breath
Oral:		Repeated exposure can cause damage to teeth and upset stomach
Corrosion Irrita	ition:	
Dermai:	7664-93-9	Rabbit - Extremely corrosive and destructive to tissue.
Ocular:	7664-93-9	Rabbit - Corresive to eyes,
Sensitization: No additional information,		
Single Target (Organ (STOT):	No additional information,
Numerical Mea	sures:	No additional information,
Carcinogenicity		Strong inorganic acid mists containing sulfuric acid: IARC Group 1
Mutagenicity:		No additional information.
Reproductive Toxicity:		No additional information.

SECTION 12: Ecological Information

Ecotoxicity: 7664-93-9: EC50 - Daphnia magna (Water flea) - 29 mg/l - 24 h

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Safety Data Sheet according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014 Page 7 of 8 Sulfuric Acid, 1.0N

SECTION 15: Regulatory information

United States (USA)

源

SARA Section 311/312 (Specific toxic chemical listings):

Reactive, Acute, Chronii

SARA Section 313 (Specific toxic chemical listings):

7664-93-9 Sulfuric acid.

RCRA (hazardous waste code): None of the ingredients are listed.

TSCA (Toxic Substances Control Act):

None of the ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7664-93-9 sulfuric acid 1000 lb.

Proposition 65 (California)

Chemicals known to cause cancer.

7664-93-9 sulfuric acid.

- Chemicals known to cause reproductive toxicity for females None of the ingredients are listed.
- Chemicals known to cause reproductive toxicity for males:
- None of the ingredients are listed,
- Chemicals known to cause developmental toxicity
- None of the ingredients are listed.

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed,

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients are listed. Canadian NPRI Ingredient Disclosure list (limit 1%):

7664-93-9 Sulfuric acid.

SECTION Le: Other Information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and This product has been classified in accordance with hazard orders of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note: The responsibility provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individuel operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate, inverser, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume on lability for dramages incurred by the use of this material, its the responsibility of the user to comply with all applicable laws and modulation store. regulations applicable to this material.

GHS Full Text Phrases: None

Page 6 of 8

7664-93-9: LC50 - Gambusia affinis (Mosquito fish) - 42 mg/(- 95 h

Persistence and degradability:

Not applicable for test method.

Bioaccumulative potential Not Bigaccumulative.

Effective date : 12.05.2014

Mobility in soll:

1990 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 -

Aqueous solution has high mobility in soil.

Other adverse effects

Concentrated sulfuric acid has moderate acute and chronic toxicity to acuatic life, which is driven by the pH of the aquatic environment, as a result of the presence of the acid. Small quantities will be neutralized by natural alkalinity.

SECTION 13: Disposel considerations

Waste discosal recommendations:

Product/containers must not be disposed together with household garbage. Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to property characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Consult federal state/ provincial and local regulations regarding the proper disposal of waste material hat may incorporate some amount of this product.

SECTION 14: Transport Information

UN-Number:

2796 UN proper shipping name:

Sulfuric Acid Solution

Transport hazard class(es):

. 스톱 Class: • 8 Corrosive substances

Packing group: II Environmental bazard: None Transport in bulk:

Name: 49CFR173,242 Ship type: Not Applicable Pollution category: Y

Special precautions for user:

N34: Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous material. A3: For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings. A3. A7. B3. B83. B84, IB2, N34, T8, TP2.

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Safety Data Sheet according to 29CFR1910/1200 and GHS Rev. 3

Effective date : 12.05.2014 Page 8 of 8 Sulfuric Acid, 1.0N

Abbreviations and Acronyms:

MDGInternationa) Maritime Code for Dangerous Goods. PMECPredicted No-Effect Concentration (REACH). CFRCode of Federal Regulations (USA). SARASuperfund Amendments and Reauthorization Act (on Act (USA). RCRAResource Conservation and Recovery Act (USA). TSCAToxic Substances Control Act (USA). TSCAToxic Substances Control Act (USA). NPRNational Pollutant Release Inventory (Conada). DOTUS Department of Transportation. RitAnternetional Air Transport Association. GHSGIobally Harmanized System of Classification and Labelling of Chemicals. ACGIHAmarican Conference of Governmental Industrial Hygienists. CASChemical Abstracts Service (division of the American Chemical Society). Constrainton Association (SSA), NPANAtional Fire Protection Association (USA), HMISHazardoux Materials Identification System (USA), WHMISWorkplace Hazardoux Materials Information System (Canada), DHEDerived No-Effect Level (REACH),

Effective date: 12.05.2014 Last updated: 06.19.2015

MATERIAL SAFETY DATA SHEET

MSDS No.: CC0420 Revision Date: November 23, 2011 Approved by: James A. Bertsch

MSDS No.: CC042	0	
Section 1	Chemical Product and Com	any Information
Product	COPPER METAL	
Synonyms	N/A	· · · · · · · · · · · · · · · · · · ·

CHEMTREC 24 Hour Emergency Phone Number (800) 424-9300

Section 2 Hazards Identification

Cognitive Learning Systems, Inc. 2750 Paxlon Street

Harrishum PA 17111

Emergency Overview

CAUTION!

DO NOT BREATHE METAL DUST.

0 = Minimal	Health	0	
1 = Slight	Fire	0	
2 = Moderate	Reactivity	0	
3 = Serious	readouting	0	1
4 = Severe	Contact	0	
	HMIS	*	

May be harmful if swallowed. Harmful if inhaled as dust or fume. May cause irritation to skin and eyes. Avoid contact with Nitric acid, emits toxic fumes of nitrogen oxides. Target organs: Liver, kidneys.

Chemical Name	CAS #	%	TLV Units
Copper	7440-50-8	100%	TWA: 1.0 mg/m ³ dusts and mists as C TWA: 0.2 mg/m ³ _{fume} (ACGIH 2001)
	:		

Section 4 First Aid Measures

INGESTION: Call physician or Poison Control Center inimediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN CONTACT: Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5 Fire Fighting Measures

General information: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Non-flammable and non-combustible solid, but air-born dust may ignite. Do not use water to fight fires involving this material.

Extinguishing Media: Use triclass, dry chemical fire extinguisher. Flash Point: Non-combustible. Autoignition temperature: N/A	0 = Minimai 1 = Slight 2 = Moderate 3 = Serious	
Explosion Limits: Lower: N/A Upper: N/A	4 = Severe	None listed.
Section 6 Accidental Release Measures		

Use proper personal protective equipment as indicated in Section 8. Remove all sources of ignition. Provide adequate ventilation. Recover for use if not contaminated. Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water. Avoid runoff into storm sewers and ditches which lead to waterways.

Section 7 Handling & Storage GENERAL STORAGE CODE GREEN

Read label on container before using. Do not wear contact lenses when working with chemicals. Keep container

tightly closed. For laboratory use only. Not for drug, food or household use. Keep out of reach of children. Handling: Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Avoid ingestion. Do not inhale dust. Wash thoroughly after handling. Remove and wash clothing before reuse.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from ignition sources.

Section 8 Exposure Controls / Personal Protection

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None needed in normal laboratory handling. If dusty conditions prevail, work in a ventilation hood or wear a NIOSH/MSHA-approved dust mask.

Section 9 Physical & Chemical Properties

Physical state: Solid.	Boiling point: 2595°C (4703°F)
Appearance: Reddish-brown, lustrous metal.	Freezing / Melting point: 1083°C (1981°F)
Odor: No odor.	Decomposition temperature: N/A
pH: N/A	Solubility: Insoluble.
Vapor pressure (mm Hg): 1 mm @ 1628°C	Specific gravity (H ₂ O = 1): 8.92 @ 20°C
Vapor Density (Air = 1): N/A	Percent volatile (%): N/A
Evaporation rate (Butyl acetate = 1): N/A	Molecular formula: Cu
Viscosity: N/A	Molecular weight: 63.55
Section 10 Stability & Reactivity	
Chemical stability: Stable	Hazardous polymerization: Will not occur.

Conditions to avoid: Excessive temperatures, heat, sparks, open flame and other sources of ignition. Acids.

Incompatibilities with other materials: Strong acids, oxidizers, alkalies, bromates, chlorates, iodates, sodium azide, acetyline and halogens.

Hazardous decomposition products: Nitrogen oxide is reacted with nitric acid.

Section 11 Toxicological Information

Effects of overexposure: Inhalation of this material can cause intense sneezing, nausea, vomiting, weakness and metal fume fever. Ingestion of this material may cause moderate irritation to the stomach lining. If product gets into eyes, corneal abrasions may occur. May cause irritation on contact with skin. Repeated or prolonged exposure may cause liver and kidney damage, with an increased risk with Wilson's disease.

ORL-RAT LD50: N/A RTECS #: GL5325000

Section 12 Ecological Information

Data not yet available.

Section 13 Disposal Considerations

These disposal guidelines are intended for the disposal of catalog-size quantities only. Federal regulations may apply to empty container. State and/or local regulations may be different. Dispose of in accordance with all local, state and federal regulations or contract with a licensed chemical disposal agency.

Section 14 Transport Information UN/NA number: N/A

Shipping name: Not Regulated.

Hazard class: N/A

Packing group: N/A

Exceptions: N/A

Section 15 Regulatory Information

TSCA-listed, EINECS-listed (231-159-6), RCRA code D001, Ca Prop 65-Not listed.

Section 16 Additional Information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. * Hazardous Materials Industrial Standards.

SAFETY DATA SHEET

Section 1	Identification	Page E1 of E
🛟 N	Nasco 901 Janesville Ave. Fort Atkinson, WI 53538-0901 Phone: 920-563-2446	CHEMTREC 24 Hour Emergency Phone Number (800) 424-9300 For laboratory and industrial use only. Not for drug, food or household use.
Product CC	OPPER(II) SULFATE, PENTAHYDRATE	
Synonyms Cu	upric Sulfate, 5-Hydrate	
Section 2	Hazards identification	
GHS Classificat Acute toxicity-ora Skin irritation (Ca Eye irritation (Ca Aquatic acute tox Aquatic chronic tr GHS Label infor H302: Harmful if H315: Causes sk H319: Causes se	HS07 / GHS09 Liver, Kidneys, Lungs, Spleen. tion: al (Category 4) ategory 2) tegory 2A) kicity (Category 1) toxicity (Category 1) tration: Hazard statement: swallowed.	 Precautionary statement: P264: Wash hands thoroughly after handling. P270: Do not eat, drink or smoke when using this product. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection. P301+P330+P312: IF SWALLOWED: Rinse mouth. Call a POISON CENTER or doctor if you feel unwell. P302+P352: IF ON SKIN: Wash with plenty of water and soap. P305+P351+P338: IF IN EYES: Rinse cautiously with water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P332+P313: If skin irritation occurs: Get medical attention. P362+P364: Take off contaminated clothing and wash it before reuse. P391: Collect spillage. P501: Dispose of contents/container to a licensed chemical disposal agency in accordance with local/regional/national regulations.

Hazards not otherwise classified:

Health hazards not otherwise classified (HHNOC) - Not Known Physical hazards not otherwise classified (PHNOC) - Not Known

Section 3	Composition / information on ingredients						
Chemical Name		CAS #	%	EINECS			
Cupric sulfate		7758-99-8	>99%	231-847-6 (anhydrous)			
Section 4	First aid measures	1	1	1			

INGESTION: HARMFUL IF SWALLOWED. Call physician or Poison Control Center immediately. Induce vomiting only if advised by appropriate medical personnel. Never give anything by mouth to an unconscious person.

INHALATION: HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT IRRITATION. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: CAUSES SEVERE EYE IRRITATION. Check for and remove contact lenses. Flush thoroughly with water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get immediate medical attention.

SKIN ABSORPTION: CAUSES SKIN IRRITATION. Remove contaminated clothing. Flush thoroughly with mild soap and water. If irritation occurs, get medical attention.

Section 5

Suitable Extinguishing Media: Use any media suitable for extinguishing supporting fire

Fire fighting measures

Protective Actions for Fire-fighters: In fire conditions, wear a NIOSH/MSHA-approved self-contained breathing apparatus and full protective gear. Use water spray to keep fire-exposed containers cool.

Specific Hazards: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Section 6 Accidental release measures

Personal Precautions: Evacuate personnel to safe area. Use proper personal protective equipment as indicated in Section 8. Provide adequate ventilation.

Environmental Precautions: Avoid runoff into storm sewers and ditches which lead to waterways.

Containment and Cleanup: Sweep or vacuum up and place in a suitable container for proper disposal. Wash spill area with soap and water.

Section 7 Handling and storage

Precautions for Safe Handling: Read label on container before using. Do not wear contact lenses when working with chemicals. Keep out of reach of children. Avoid contact with eyes, skin and clothing. Do not inhale dusts. Use with adequate ventilation. Avoid ingestion. Wash thoroughly after handling. Remove and wash clothing before reuse.

Conditions for Safe Storage: Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8	Exposure controls / personal protection				
Exposuro Limite:	Chemical Name	ACGIH (TLV)	OSHA (PEL)	NIOSH (REL)	
Exposure Limits:	Copper, dusts and mists, as Cu	TWA: 1 mg/m ³	TWA: 1 mg/m ³	TWA: 1 mg/m ³	

Engineering controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower and fire extinguishing material. Personnel should wear safety glasses, goggles, or faceshield, lab coat or apron, appropriate protective gloves. Use adequate ventilation to keep airborne concentrations low.

Respiratory protection: None should be needed in normal laboratory handling at room temperatures. If dusty conditions prevail, work in fume hood or wear a NIOSH/MSHAapproved respirator.

approved respirate	Л.						
Section 9	Physical and chem	ical properties					
Appearance: Blue Odor: Odorless Odor threshold: I pH: 3.7-4.2 (10% Melting / Freezing Boiling point: De Flash point: Non-	Data not available solution) point: 150°C (302°F) composes	Flammability (Explosion limi Vapor pressur Vapor density Relative densi	tte (=1): Not applic solid/gas): Not applic ts: Lower / Upper: N e (mm Hg): 20 torr @ (Air = 1): Data not av ty (Specific gravity): 31.6 g/100 ml water	able lot applicable 22.5°C ailable 2.284	Auto-ignitio Decomposi Viscosity: Molecular f		Data not available re: 560°C (1040°F) le.
Section 10	Stability and reactive	vity					
Chemical stability Conditions to avo			us polymerization: V nder normal temperatu		void high tempe	ratures, exposure	to air and incompatible mater
Incompatible mat iron.	erials: Reducing agents, a	acetylene or nitromethan	e, magnesium, strong	bases, alkalines, ph	osphates, hydra	zine, zirconium.	Can corrode aluminum, steel
Hazardous decon	position products: Oxid	es of sulfur and copper fu	imes.				
Section 11	Toxicological infor	mation					
Carcinogenity: D NTP: No compone IARC: No compone OSHA: No compone Ca Prop 65: This p Reproductive tox STOT-single expo STOT-repeated et Aspiration hazard Potential health e Inhalation: May ca Ingestion: Ingesti Skin: Contact with Eyes: Can cause Signs and sympt depression and cc dizziness, jaundica Additional inform Section 12	ent of this product present a ent of this product present nent of this product present product does not contain au icity: Data not available osure: Data not available osure: Data not available offects: ause irritation to the mucou on can cause irritation to th a skin causes slight irritation severe irritation and may norulsions may be needed. e, and general debility. nation: RTECS #: GL890 Ecological information	at levels greater than or e at levels greater than or it at levels greater than o ny chemicals known to the ole us membranes and upper the digestive tract and abo n. Excessive exposure m esult in irreversible eye co o physician: Probable m . Wilson's disease can b 0000 tion	equal to 0.1% is ident r equal to 0.1% is ident r espiratory tract. lominal pain. lay cause allergic derr lamage. ucosal damage may c e aggravated by exces	ified as probable, po tified as a carcinogo o cause cancer or re natitis. May cause i ontradict the use of ssive exposure. Syn	ossible or confir en or potential c eproductive toxic irritation or burn gastric lavage. mptoms include	med human carc arcinogen by OS city. s on wet skin. Measures again	
Toxicity to daphn Toxicity to algae:	degradability: No data av	rtebrates: No data avail vailable Bioaccum		data available	Jusj		
Other adverse eff	ects: An environmental ha	azard cannot be exclude	d in the event of unpro	fessional handling o	or disposal.		
Section 13	Disposal considera						
	uidelines are intended f be different. Dispose of						ontainer. State and/or local mical disposal agency.
Section 14	Transport informa						
UN/NA number Hazard class: 9 Exceptions: N		pping name: Enviro cking group: III or less than 4.539 Kg ;	Reporta	ble Quantity: 10) lbs (4.54 kg)	Ma	rine pollutant: Yes 20 ERG Guide # 171
Section 15	Regulatory informa	-	, ,				-
	red to be listed if the CAS nur		is on the Inventory list.				
Compo	nent	TSCA	CERLCA (RQ)	RCRA code	DSL	NDSL	CA Prop 65
Cupric sulfate		Listed	10 lbs (4.54 kg)	Not listed	Not listed	Not listed	This product does not contain any chemicals known to the Stat of California to cause cancer or reproductive taxisity

Section 16 Other information

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees. NTP: National Toxicology Program, IARC: International Agency for Research on Cancer, OSHA: Occupational Safety and Health Administration, STOT: Specific Target Organ Toxicity, SE: Single Exposure, RE: Repeated Exposure, ERG: Emergency Response Guidebook. Form 06/2015

reproductive toxicity.

Printing date 05/09/2022

Reviewed on 05/09/2022

1 Identification

- · Product identifier
- · Trade name: Epsom Salt
- Article number: 050-1159
- CAS Number: 10034-99-8
- *EC number:* 231-298-2
- Details of the supplier of the safety data sheet
 Manufacturer/Supplier: Aqua Solutions, Inc.
 6913 Highway 225 DEER PARK, TX 77536 USA
 800-256-2586
- · Information department:
- Technical Coordinator Sherman Nelson shermann@aquasolutions.org Technical Coordinator Sherman Nelson shermann@aquasolutions.org
- Emergency telephone number: Chemtrec: 800-424-9300 Canutec: 613-996-6666

2 Hazard(s) identification

· Classification of the substance or mixture The substance is not classified, according to the Globally Harmonized System (GHS). · Label elements · GHS label elements Not Applicable · Hazard pictograms Not Applicable · Signal word Not Applicable · Hazard statements Not Applicable · Precautionary statements Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. If swallowed: Call a poison center/doctor if you feel unwell. If on skin: Wash with plenty of water. If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Store in a dry place. Store in a closed container. Dispose of contents/container in accordance with local/regional/national/international regulations. · Classification system: · NFPA ratings (scale 0 - 4) Health = 1Fire = 0Reactivity = 0

(Contd. on page 2)

US -

Printing date 05/09/2022

Reviewed on 05/09/2022

(Contd. of page 1)

Trade name: Epsom Salt

· HMIS-ratings (scale 0 - 4)

• Other hazards

· Results of PBT and vPvB assessment

- **PBT:** Not applicable.
- · vPvB: Not applicable.

3 Composition/information on ingredients

- · Chemical characterization: Substances
- · CAS No. Description
- CAS: 10034-99-8 Magnesium Sulfate Heptahydrate
- · Identification number(s)
- EC number: 231-298-2

4 First-aid measures

- · Description of first aid measures
- · General information: No special measures required.
- · After inhalation: Supply fresh air; consult doctor in case of complaints.
- · After skin contact: Generally the product does not irritate the skin.
- · After eye contact: Rinse opened eye for several minutes under running water.
- After swallowing: If symptoms persist consult doctor.
- · Information for doctor:
- · Most important symptoms and effects, both acute and delayed No further relevant information available.
- · Indication of any immediate medical attention and special treatment needed
- No further relevant information available.

5 Fire-fighting measures

- · Extinguishing media
- Suitable extinguishing agents: Use fire fighting measures that suit the environment.
- · Special hazards arising from the substance or mixture No further relevant information available.
- · Advice for firefighters
- · Protective equipment: No special measures required.

6 Accidental release measures

- · Personal precautions, protective equipment and emergency procedures Not required.
- · Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- · Methods and material for containment and cleaning up: Pick up mechanically.
- · Reference to other sections
- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.
- · Protective Action Criteria for Chemicals

· PAC-1: 33 mg/m³

(Contd. on page 3)

Printing date 05/09/2022

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(Contd. of page 2)

Trade name: Epsom Salt

- **PAC-2:** 370 mg/m³
- · PAC-3: 2,300 mg/m³

7 Handling and storage

- · Handling:
- · Precautions for safe handling No special measures required.
- Information about protection against explosions and fires: No special measures required.
- · Conditions for safe storage, including any incompatibilities
- · Storage:
- · Requirements to be met by storerooms and receptacles: No special requirements.
- · Information about storage in one common storage facility: Not required.
- Further information about storage conditions: None.
- *Specific end use(s) No further relevant information available.*

8 Exposure controls/personal protection

• Additional information about design of technical systems: No further data; see item 7.

- · Control parameters
- · Components with limit values that require monitoring at the workplace: Not required.
- Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- · General protective and hygienic measures:

The usual precautionary measures for handling chemicals should be followed.

- · Breathing equipment: Not required.
- · Protection of hands:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation • Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- *Penetration time of glove material The exact break through time has to*
- The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- *Eye protection:* Not required.
- · Body protection: Protective work clothing

Information on basic phy	vsical and chemical properties	
General Information		
Appearance:		
Form:	Crystalline	
Color:	White	
Odor:	Odorless	

Printing date 05/09/2022

Reviewed on 05/09/2022

Trade name: Epsom Salt

		(Contd. of page
· Odor threshold:	Not determined.	
· pH-value:	5-8	
• Change in condition Melting point/Melting range: Boiling point/Boiling range:	1,124 °C (3424 °F) Undetermined.	
· Flash point:	Not applicable.	
· Flammability (solid, gaseous):	Product is not flammable.	
Decomposition temperature:	Not determined.	
· Auto igniting:	Not determined.	
• Danger of explosion:	Product does not present an explosion hazard.	
· Explosion limits: Lower: Upper:	Not determined. Not determined.	
· Vapor pressure:	Not applicable.	
• Density at 20 °C (68 °F): • Relative density • Vapor density • Evaporation rate	1.67 g/cm ³ (13.93615 lbs/gal) Not determined. Not applicable. Not applicable.	
• Solubility in / Miscibility with Water at 20 °C (68 °F):	246 g/l	
· Partition coefficient (n-octanol/wa	ter): Not determined.	
· Viscosity: Dynamic: Kinematic:	Not applicable. Not applicable.	
• Other information	No further relevant information available.	

10 Stability and reactivity

• *Reactivity* No further relevant information available.

· Chemical stability

- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- · Information on toxicological effects
- · Acute toxicity:
- · Primary irritant effect:
- on the skin: No irritant effect.
- \cdot on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.

(Contd. on page 5)

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Reviewed on 05/09/2022

(Contd. of page 4)

Trade name: Epsom Salt

 \cdot Additional toxicological information:

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us. The substance is not subject to classification.

- · Carcinogenic categories
- · IARC (International Agency for Research on Cancer) Substance is not listed.
- · NTP (National Toxicology Program) Substance is not listed.
- · OSHA-Ca (Occupational Safety & Health Administration) Substance is not listed.

12 Ecological information

· Toxicity

- Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- · Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- *Mobility in soil* No further relevant information available.
- · Additional ecological information:

· General notes:

Water hazard class 1 (Assessment by list): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. • **Results of PBT and vPvB assessment**

- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

· Waste treatment methods

· Recommendation: Smaller quantities can be disposed of with household waste.

· Uncleaned packagings:

• Recommendation: Disposal must be made according to official regulations.

UN-Number		
DOT, ADN, IMDG, IATA	Not regulated	
UN proper shipping name		
DOT, ADN, IATA	Not regulated	
IMDG	Not Regulated	
	Not regulated	
Transport hazard class(es)		
DOT, ADN, IMDG, IATA		
Class	Not regulated	
Packing group		
DOT, IMDG, IATA	Not regulated	

Printing date 05/09/2022

Reviewed on 05/09/2022

Trade name: Epsom Salt

	(Contd. of page 5
· Environmental hazards: · Marine pollutant:	No
· Special precautions for user	Not applicable.
• Transport in bulk according to Annex II MARPOL73/78 and the IBC Code	I of Not applicable.
· Transport/Additional information:	
· DOT · Remarks:	Not regulated
· IMDG · Remarks:	Not regulated
· IATA · Remarks:	Not regulated
· UN "Model Regulation":	Not regulated

15 Regulatory information

• Safety, health and environmental regulations/legislation specific for the substance or mixture No further relevant information available.

· Sara

- · Section 355 (extremely hazardous substances): Substance is not listed.
- Section 313 (Specific toxic chemical listings): Substance is not listed.
- TSCA (Toxic Substances Control Act):
- · Hazardous Air Pollutants Substance is not listed.
- · Proposition 65
- · Chemicals known to cause cancer: Substance is not listed.
- · Chemicals known to cause reproductive toxicity for females: Substance is not listed.
- · Chemicals known to cause reproductive toxicity for males: Substance is not listed.
- · Chemicals known to cause developmental toxicity: Substance is not listed.

- · EPA (Environmental Protection Agency) Substance is not listed.
- TLV (Threshold Limit Value) Substance is not listed.
- · NIOSH-Ca (National Institute for Occupational Safety and Health) Substance is not listed.
- · GHS label elements Not Applicable
- · Hazard pictograms Not Applicable
- · Signal word Not Applicable
- · Hazard statements Not Applicable
- · Precautionary statements
- Do not get in eyes, on skin, or on clothing.
- Wash thoroughly after handling.
- If swallowed: Call a poison center/doctor if you feel unwell.
- If on skin: Wash with plenty of water.
- If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Store in a dry place. Store in a closed container.

Dispose of contents/container in accordance with local/regional/national/international regulations.

(Contd. on page 7)

[·] Carcinogenic categories

[–] US

Printing date 05/09/2022

Reviewed on 05/09/2022

Trade name: Epsom Salt

(Contd. of page 6)

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

· Contact:

· Date of preparation / last revision 05/09/2022 / 1.3 • Abbreviations and acronyms: IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association EINECS: European Inventory of Existing Commercial Chemical Substances CAS: Chemical Abstracts Service (division of the American Chemical Society) NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit REL: Recommended Exposure Limit • * Data compared to the previous version altered.

Printing date 05/10/2021

Reviewed on 05/10/2021

1 Identification

- · Product identifier
- · Trade name: Baking Soda, Laboratory Grade Powder
- Article number: 021-1529
- CAS Number: 144-55-8
- EC number: 205-633-8
- Details of the supplier of the safety data sheet
 Manufacturer/Supplier: Aqua Solutions, Inc.
 6913 Highway 225 DEER PARK, TX 77536 USA
 800-256-2586
- Information department: Technical Coordinator
 Sherman Nelson shermann@aquasolutions.org
 Emergency telephone number:
- Chemtrec: 800-424-9300 Canutec: 613-996-6666

2 Hazard(s) identification

- *Classification of the substance or mixture The substance is not classified, according to the Globally Harmonized System (GHS).*
- · Label elements
- · GHS label elements Not Applicable
- · Hazard pictograms Not Applicable
- · Signal word Not Applicable
- · Hazard statements Not Applicable
- · Precautionary statements
- If swallowed: Call a poison center/doctor if you feel unwell.
- If on skin: Wash with plenty of water.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

- · Classification system:
- · NFPA ratings (scale 0 4)



· HMIS-ratings (scale 0 - 4)

HEALTH1Health = 1FIRE0Fire = 0REACTIVITY0Reactivity = 0

· Other hazards

- · Results of PBT and vPvB assessment
- · PBT: Not applicable.

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US

Printing date 05/10/2021

Reviewed on 05/10/2021

Trade name: Baking Soda, Laboratory Grade Powder

• **vPvB:** Not applicable.

(Contd. of page 1)

3 Composition/information on ingredients

- · Chemical characterization: Substances
- · CAS No. Description
- 144-55-8 Sodium Bicarbonate
- Identification number(s)
- EC number: 205-633-8

4 First-aid measures

- · Description of first aid measures
- · General information: No special measures required.
- · After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- · After eye contact: Rinse opened eye for several minutes under running water.
- After swallowing: If symptoms persist consult doctor.
- Information for doctor:
- · Most important symptoms and effects, both acute and delayed No further relevant information available.
- · Indication of any immediate medical attention and special treatment needed
- No further relevant information available.

5 *Fire-fighting measures*

- · Extinguishing media
- Suitable extinguishing agents: Use fire fighting measures that suit the environment.
- Special hazards arising from the substance or mixture No further relevant information available.
- · Advice for firefighters
- · Protective equipment: No special measures required.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Not required.
- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up: Pick up mechanically.
- · Reference to other sections
- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.
- · Protective Action Criteria for Chemicals
- · PAC-1: 13 mg/m³
- · PAC-2: 140 mg/m³
- · PAC-3: 840 mg/m3

7 Handling and storage

· Handling:

· Precautions for safe handling No special measures required.

(Contd. on page 3)

US -

Printing date 05/10/2021

Reviewed on 05/10/2021

Trade name: Baking Soda, Laboratory Grade Powder

· Information about protection against explosions and fires: No special measures required.

· Conditions for safe storage, including any incompatibilities

· Storage:

• Requirements to be met by storerooms and receptacles: No special requirements.

• Information about storage in one common storage facility: Not required.

• Further information about storage conditions: None.

• Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see item 7.

· Control parameters

· Components with limit values that require monitoring at the workplace: Not required.

• Additional information: The lists that were valid during the creation were used as basis.

· Exposure controls

- · Personal protective equipment:
- General protective and hygienic measures:
- The usual precautionary measures for handling chemicals should be followed.
- · Breathing equipment: Not required.

· Protection of hands:

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation \cdot **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· Eye protection: Not required.

· Body protection: Protective work clothing

Information on basic physical and o General Information Appearance:	chemical properties	
Form:	Powder	
Color:	White	
Odor:	Odorless	
Odor threshold:	Not determined.	
pH-value:	Not applicable.	
Change in condition		
Melting point/Melting range:	300 °C (572 °F)	
Boiling point/Boiling range:	Undetermined.	
Flash point:	Not applicable.	

(Contd. of page 2)

Printing date 05/10/2021

Reviewed on 05/10/2021

Trade name: Baking Soda, Laboratory Grade Powder

		(Contd. of page 3)
· Flammability (solid, gaseous):	Product is not flammable.	
· Decomposition temperature:	Not determined.	
· Auto igniting:	Not determined.	
· Danger of explosion:	Product does not present an explosion hazard.	
· Explosion limits:		
Lower:	Not determined.	
Upper:	Not determined.	
· Vapor pressure:	Not applicable.	
· Density at 20 °C (68 °F):	2.16 g/cm ³ (18.0252 lbs/gal)	
· Relative density	Not determined.	
· Vapor density	Not applicable.	
· Evaporation rate	Not applicable.	
· Solubility in / Miscibility with		
<i>Water at 20 °C (68 °F):</i>	50 g/l	
· Partition coefficient (n-octanol/wa	t ter): Not determined.	
· Viscosity:		
Dynamic:	Not applicable.	
Kinematic:	Not applicable.	
· Other information	No further relevant information available.	

10 Stability and reactivity

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- · Information on toxicological effects
- · Acute toxicity:
- · Primary irritant effect: Eyes-Rabbit-mild eye irritation 30s time
- on the skin: No irritant effect.
- on the eye: No irritating effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information: When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us. The substance is not subject to classification.
- · Carcinogenic categories
- · IARC (International Agency for Research on Cancer) Substance is not listed.
- · NTP (National Toxicology Program) Substance is not listed.

(Contd. on page 5)

⁻US

Printing date 05/10/2021

Reviewed on 05/10/2021

(Contd. of page 4)

Trade name: Baking Soda, Laboratory Grade Powder

· OSHA-Ca (Occupational Safety & Health Administration) Substance is not listed.

12 Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- · Persistence and degradability No further relevant information available.
- · Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- · Mobility in soil No further relevant information available.
- Additional ecological information:
- · General notes:
- Water hazard class 1 (Assessment by list): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. • Results of PBT and vPvB assessment

- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- · Waste treatment methods
- Recommendation: Smaller quantities can be disposed of with household waste.
- · Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.
- · Recommended cleansing agent: Water, if necessary with cleansing agents.

· UN-Number	No Allocation	
DOT, ADN, IMDG, IATA	Not regulated	
UN proper shipping name		
DOT	Not regulated	
	Not regulated	
ADN, IATA	Not regulated	
IMDG	Not Regulated	
	Not regulated	
Transport hazard class(es)		
DOT	Not applicable	
- Class	Not regulated	
ADN/R Class:	Not regulated	
· Packing group		
DOT, IMDG, IATA	Not regulated	
Environmental hazards:		
Marine pollutant:	No	

Printing date 05/10/2021

Reviewed on 05/10/2021

Trade name: Baking Soda, Laboratory Grade Powder

	(Contd. of page :
· Special precautions for user	Not applicable.
• Transport in bulk according to Annex II MARPOL73/78 and the IBC Code	of Not applicable.
· Transport/Additional information:	
· DOT · Remarks:	Not regulated
· IMDG · Remarks:	Not regulated
· IATA · Remarks:	Not regulated
· UN "Model Regulation":	Not regulated

15 Regulatory information

 \cdot Safety, health and environmental regulations/legislation specific for the substance or mixture \cdot Sara

- · Section 355 (extremely hazardous substances): Substance is not listed.
- Section 313 (Specific toxic chemical listings): Substance is not listed.
- TSCA (Toxic Substances Control Act): ACTIVE
- · Hazardous Air Pollutants Substance is not listed.
- · Proposition 65
- · Chemicals known to cause cancer: Substance is not listed.
- · Chemicals known to cause reproductive toxicity for females: Substance is not listed.
- · Chemicals known to cause reproductive toxicity for males: Substance is not listed.
- · Chemicals known to cause developmental toxicity: Substance is not listed.
- · Carcinogenic categories
- · EPA (Environmental Protection Agency) Substance is not listed.
- TLV (Threshold Limit Value) Substance is not listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health) Substance is not listed.
- · GHS label elements Not Applicable
- · Hazard pictograms Not Applicable
- · Signal word Not Applicable
- · Hazard statements Not Applicable
- · Precautionary statements
- If swallowed: Call a poison center/doctor if you feel unwell.
- If on skin: Wash with plenty of water.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

- · National regulations:
- · Additional classification according to Decree on Hazardous Materials: None
- · Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing SDS: Environment protection department.

(Contd. on page 7)

US –

Printing date 05/10/2021

Reviewed on 05/10/2021

Trade name: Baking Soda, Laboratory Grade Powder

	(Contd. of page 6
Contact:	
Date of preparation / last revision	
Revision 1.0 05-07-2021: updated hazard information. STN	
Revision 0.0, 11-28-2016: Creation date for SDS. STN	
05/10/2021 / 1.0	
Abbreviations and acronyms:	
IMDG: International Maritime Code for Dangerous Goods	
DOT: US Department of Transportation	
IATA: International Air Transport Association	
EINECS: European Inventory of Existing Commercial Chemical Substances	
CAS: Chemical Abstracts Service (division of the American Chemical Society)	
NFPA: National Fire Protection Association (USA)	
HMIS: Hazardous Materials Identification System (USA)	
PBT: Persistent, Bioaccumulative and Toxic	
vPvB: very Persistent and very Bioaccumulative	
NIOSH: National Institute for Occupational Safety	
OSHA: Occupational Safety & Health	
TLV: Threshold Limit Value	
PEL: Permissible Exposure Limit	
REL: Recommended Exposure Limit	
* Data compared to the previous version altered.	
The second	

SAFETY DATA SHEET

Revision date 11-November-2022

1. Identification	
Product identifier	
Product Name	CORN STARCH, POWDER, NF
Other means of identification	
Product Code(s)	S1552
Synonyms	None
Recommended use of the chemical	and restrictions on use
Recommended use	No information available
Restrictions on use	No information available
Details of the supplier of the safety	data sheet
Supplier Address Spectrum Chemical Mfg. Corp. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000	
Emergency telephone number	
Emergency Telephone	Chemtrec 1-800-424-9300
2. Hazard(s) identification	
<u>Classification</u>	
Combustible dust	Yes
Hazards not otherwise classified (H Not applicable	NOC)

Label elements		
Warning		
Hazard statements May form combustible dust concentratic	ons in air	
Appearance Powder	Physical state Solid	Odor No information available

Revision Number 2

Other information No information available.

3. Composition/information on ingredients

Substance

Chemical name	CAS No	Weight-%
Starch (Corn)	9005-25-8	100

4. First-aid measures

Description of first aid measures

Inhalation	Remove to fresh air.	
Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.	
Skin contact	Wash skin with soap and water.	
Ingestion	Clean mouth with water and drink afterwards plenty of water.	
Most important symptoms and effects, both acute and delayed		
Symptoms	No information available.	
Indication of any immediate medical attention and special treatment needed		

Note to physicians Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.	
Large Fire	CAUTION: Use of water spray when fighting fire may be inefficient.	
Unsuitable extinguishing media	Do not scatter spilled material with high pressure water streams.	
Specific hazards arising from the chemical	Avoid generation of dust. Fine dust dispersed in air may ignite.	
Hazardous combustion products	Carbon Monoxide, Carbon Dioxide.	
Explosion data Sensitivity to mechanical impact none.		
Sensitivity to static discharge	yes.	
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.	

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions	Ensure adequate ventilation. Avoid generation of dust. Avoid contact with eyes. Use personal protective equipment as required. Do not breathe dust. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Take precautionary measures against static discharges.	
Other information	Refer to protective measures listed in Sections 7 and 8.	
Methods and material for containment and cleaning up		
Methods for containment	Prevent further leakage or spillage if safe to do so. Prevent dust cloud.	
Methods for cleaning up	Take up with inert, damp, non-combustible material using clean non-sparking tools and place into loosely covered plastic containers for later disposal. Pick up and transfer to properly labeled containers.	

7. H	andlind	and	storage	
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Precautions for safe handling

Advice on safe handling	Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation. Avoid generation of dust. Do not breathe dust. Avoid contact with eyes. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Keep out of the reach of children.

8. Exposure controls/personal protection

Control parameters

Exposure Limits

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Starch (Corn)	No data available	15 mg/m³ TWA	-
9005-25-8		5 mg/m³ TWA	

Appropriate engineering controls

Engineering controls	Showers Eyewash stations Ventilation systems.	
Individual protection measures, such as personal protective equipment		
Eye/face protection	Wear safety glasses with side shields (or goggles).	
Skin and body protection	No special protective equipment required.	
Respiratory protection	No protective equipment is needed under normal use conditions. If exposure limits are	

General hygiene considerations

Do not breathe dust.

9. Physical and chemical properties

Information on basic physical and chemical properties **Physical state** Solid Appearance Powder White to Off-White Color Odor No information available **Odor threshold** No information available **Property** Values Remarks • Method no data available None known Neutral pН Melting point / freezing point no data available None known Boiling point / boiling range no data available None known Flash point no data available None known **Evaporation rate** no data available None known Flammability (solid, gas) no data available None known Flammability Limit in Air None known Upper flammability or explosive No data available limits Lower flammability or explosive No data available limits No data available None known Vapor pressure Vapor density no data available None known **Relative density** 1.5 None known Water solubility Slowly soluble in cold water None known Solubility(ies) no data available None known **Partition coefficient** No data available None known Autoignition temperature no data available None known **Decomposition temperature** None known Kinematic viscosity no data available None known Dynamic viscosity No data available None known Other information **Explosive properties** No information available No information available **Oxidizing properties** Softening point No information available No information available Molecular weight VOC Content (%) No information available Liquid Density No information available **Bulk density** No information available

10. Stability and reactivity

Reactivity	No information available.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	Excessive heat. Heating in air. dust formation.
Incompatible materials	None known based on information supplied.

Hazardous decomposition products None known based on information supplied.

11. Toxicological information

Information on likely routes of exposure

Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract.
Specific test data for the substance or mixture is not available.
Specific test data for the substance or mixture is not available.
Specific test data for the substance or mixture is not available.
chemical and toxicological characteristics

Symptoms

No information available.

Acute toxicity

Numerical measures of toxicity No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Serious eye damage/eye irritation Respiratory or skin sensitization Germ cell mutagenicity	No information available. No information available. No information available. No information available.
Reproductive toxicity	No information available.
STOT - single exposure STOT - repeated exposure Target organ effects	No information available. No information available. respiratory system, Eyes, Skin.
Aspiration hazard	No information available.
Other adverse effects	No information available.
Interactive effects	No information available.

12. Ecological information		
Ecotoxicity	The environmental impact of this product has not been fully investigated.	
Persistence and degradability Bioaccumulation	No information available. Inherently biodegradable.	
Other adverse effects	No information available.	

13. Disposal considerations

Waste treatment methods

Waste from residues/unused products	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Contaminated packaging	Do not reuse empty containers.

14. Transport information

DOT	not regulated
<u>TDG</u>	not regulated
MEX	not regulated
ICAO (air)	not regulated
IATA	not regulated
IMDG	not regulated
RID	not regulated
ADR	not regulated
ADN	not regulated

15. Regulatory information

International Inventories

TSCA

Complies

DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	This product complies with ENCS:
IECSC	This product complies with China:
KECL	Complies
PICCS	Complies
AICS	All the constituents of this material are listed on the Australian Inventory of Chemical
	Substances (AICS).

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
 EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
 ENCS - Japan Existing and New Chemical Substances
 IECSC - China Inventory of Existing Chemical Substances
 KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Starch (Corn)	-	Present	Present
9005-25-8			

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. Other information

NFPA Health hazards 0 Flammability 1 Instability 0 Physical and chemical properties -HMIS Health hazards 0 Flammability 0 Physical hazards 0 Personal protection X Key or legend to abbreviations and acronyms used in the safety data sheet Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit) Ceiling Maximum limit value Key literature references and sources for data used to compile the SDS Agency for Toxic Substances and Disease Registry (ATSDR) U.S. Environmental Protection Agency ChemView Database European Food Safety Authority (EFSA) EPA (Environmental Protection Agency) Acute Exposure Guideline Level(s) (AEGL(s)) U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act U.S. Environmental Protection Agency High Production Volume Chemicals Food Research Journal Hazardous Substance Database International Uniform Chemical Information Database (IUCLID) Japan GHS Classification Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS) NIOSH (National Institute for Occupational Safety and Health) National Library of Medicine's ChemID Plus (NLM CIP) National Library of Medicine's PubMed database (NLM PUBMED) National Toxicology Program (NTP) New Zealand's Chemical Classification and Information Database (CCID) Organization for Economic Co-operation and Development Environment, Health, and Safety Publications Organization for Economic Co-operation and Development High Production Volume Chemicals Program Organization for Economic Co-operation and Development Screening Information Data Set

World Health Organization

Revision date Revision Note <u>Disclaimer</u> 11-November-2022 No information available.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet



COMPOUND SUMMARY > LCSS

Naphthalene

Read about Laboratory Chemical Safety Summary (LCSS) project 🗹

PubChem CID	931
Structure	
	2D
Synonyms	naphthalene
	91-20-3
	Naphthalin
	Albocarbon
	Tar camphor
Molecular Formula	C ₁₀ H ₈
Molecular Weight	128.17 g/mol
	Computed by PubChem 2.2 (PubChem release 2021.10.14)

Contents

Title and Summary	
1 GHS Classification	
2 Identifiers	~
3 Physical Properties	~
4 Toxicity Information	~

5 Exposure Limits	~
6 Health and Symptoms	~
7 First Aid	
8 Flammability and Explosivity	~
9 Stability and Reactivity	~
10 Storage and Handling	~
11 Cleanup and Disposal	~
12 Additional Considerations	~
13 Information Sources	

[^] (?)

1 GHS Classification

View All 🖸 1 of 7 Note Pictograms displayed are for > 99.9% (2919 of 2920) of reports that indicate hazard statements. This chemical does not meet GHS hazard criteria for < 0.1% (1 of 2920) of reports. Pictogram(s) Health Environmental Flammable Irritant Hazard Hazard Signal Danger **GHS Hazard** H228 (39.1%): Flammable solid [Danger Flammable solids] Statements H302 (99.8%): Harmful if swallowed [Warning Acute toxicity, oral] H351 (98.9%): Suspected of causing cancer [Warning Carcinogenicity] H400 (99.6%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard] H410 (99.9%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard] Precautionary P203, P210, P240, P241, P264, P270, P273, P280, P301+P317, P318, P330, Statement Codes P370+P378, P391, P405, and P501

	(The corresponding statement to each P-code can be found at the GHS Classification page.)
ECHA C&L Notifications Summary	Aggregated GHS information provided per 2920 reports by companies from 50 notifications to the ECHA C&L Inventory. Each notification may be associated with multiple companies.
	Reported as not meeting GHS hazard criteria per 1 of 2920 reports by companies. For more detailed information, please visit ECHA C&L website.
	There are 49 notifications provided by 2919 of 2920 reports by companies with hazard statement code(s).
	Information may vary between notifications depending on impurities, additives, and other factors. The percentage value in parenthesis indicates the notified classification ratio from companies that provide hazard codes. Only hazard codes with percentage values above 10% are shown.

• European Chemicals Agency (ECHA)

2 Identifiers	2 ©
2.1 CAS	2

91-20-3

Australian Industrial Chemicals Introduction Scheme (AICIS); CAMEO Chemicals; CAS Common C...

25135-16-4

• EPA Chemicals under the TSCA

31807-65-5

EPA DSSTox

287399-39-7

• European Chemicals Agency (ECHA)

2.2 InChl

2 ()

InChI=1S/C10H8/c1-2-6-10-8-4-3-7-9(10)5-1/h1-8H

Computed by InChl 1.0.6 (PubChem release 2021.10.14)

2.3 InChlKey

UFWIBTONFRDIAS-UHFFFAOYSA-N

Computed by InChI 1.0.6 (PubChem release 2021.10.14)

PubChem

3 Physical Properties

3.1 Physical Description

Naphthalene appears as a white crystalline volatile solid with a strong coal-tar odor. The solid is denser than **water** and insoluble in **water**. Burns, but may be difficult to ignite. In the molten form it is very hot. Exposure to skin must be avoided. Also the vapors given off by the material may be toxic. Used as a moth repellent, fumigant, lubricants, and to make other chemicals, and for many other uses

CAMEO Chemicals

Naphthalene, methylnaphthalenes appears as a black liquid with the odor of coal tar. Negligibly soluble in water. Slightly denser than water. Vapors, fumes or direct contact may irritate the eyes. Direct skin contact may produce severe burns. Inhalation may produce mucous irritation, dizziness, loss of coordination, cardiovascular collapse and death.

CAMEO Chemicals

View More...

3.2 Odor

2 ()

Aromatic odor

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. V3: 2594

Hazardous Substances Data Bank (HSDB)

Odor of mothballs

() ()

(?) [/]

[^] (?)

NIOSH. NIOSH Pocket Guide to Chemical Hazards. Department of Health & Human Services, Centers for Disease Control & Prevention. National Institute for Occupational Safety & Health. DHHS (NIOSH) Publication No. 2010-168 (2010). Available from: https://www.cdc.gov/niosh/npg

Hazardous Substances Data Bank (HSDB)

Characteritic odor (plates)

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. V3: 2594

Hazardous Substances Data Bank (HSDB)

3.3 Boiling Point



424 °F at 760 mmHg (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

CAMEO Chemicals

217.9 deg C

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. Cambridge, UK: Royal Society of Chemistry, 2013., p. 1187

Hazardous Substances Data Bank (HSDB)

View More...

3.4 Melting Point

0 Z

176.4 °F (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

CAMEO Chemicals

80.2 °C

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. Cambridge, UK: Royal Society of Chemistry, 2013., p. 1187

Hazardous Substances Data Bank (HSDB)

3.5 Flash Point

190 °F (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

• CAMEO Chemicals

174 °F (NFPA, 2010)

National Fire Protection Association. 2010. Fire Protection Guide to Hazardous Materials, 14th edition, edited by Guy R. Colonna. Quincy, MA: National Fire Protection Association. Note that this information is subject to the copyright restrictions of the organization that provided the data.

CAMEO Chemicals

View More...

3.6 Solubility

2 (2)

less than 1 mg/mL at 72 °F (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

CAMEO Chemicals

In water, 31 mg/L at 25 °C

Pearlman RS et al; J Chem Ref Data 13: 555-562 (1984)

Hazardous Substances Data Bank (HSDB)

View More...

3.7 Density

2 (2)

1.15 (NIOSH, 2024) - Denser than water; will sink

CAMEO Chemicals



1.162 at 20 °C/4 °C

O'Neil, M.J. (ed.). The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals. Cambridge, UK: Royal Society of Chemistry, 2013., p. 1187

Hazardous Substances Data Bank (HSDB)

View More...

3.8 Vapor Density



4.42 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

• CAMEO Chemicals

4.42 (Air = 1)

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. V3: 2594

Hazardous Substances Data Bank (HSDB)

View More...

3.9 Vapor Pressure



0.05 mmHg at 68 °F ; 1 mmHg at 126.7 °F (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

CAMEO Chemicals

0.08 [mmHg]

Haz-Map, Information on Hazardous Chemicals and Occupational Diseases

View More...



979 °F (USCG, 1999)

U.S. Coast Guard. 1999. Chemical Hazard Response Information System (CHRIS) - Hazardous Chemical Data. Commandant Instruction 16465.12C. Washington, D.C.: U.S. Government Printing Office.

CAMEO Chemicals

979 °F (526 °C)

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 325-91

Hazardous Substances Data Bank (HSDB)

View More...

3.11 Decomposition

When heated to decomposition it emits acrid smoke and irritating fumes.

Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 2594

Hazardous Substances Data Bank (HSDB)

3.12 Corrosivity

Melted naphthalene will attack some forms of plastics, rubber, and coatings.

Mackison, F. W., R. S. Stricoff, and L. J. Partridge, Jr. (eds.). NIOSH/OSHA - Occupational Health Guidelines for Chemical Hazards. DHHS(NIOSH) Publication No. 81-123 (3 VOLS). Washington, DC: U.S. Government Printing Office, Jan. 1981.

Hazardous Substances Data Bank (HSDB)

3.13 Odor Threshold

Odor Threshold Low: 0.0095 [mmHg]

Odor Threshold High: 0.64 [mmHg]

Detection odor threshold from AIHA (mean = 0.038 ppm)

Haz-Map, Information on Hazardous Chemicals and Occupational Diseases

Odor detection in water 6.80 ppm (purity not specified)

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Fazzalari, F.A. (ed.). Compilation of Odor and Taste Threshold Values Data. ASTM Data Series DS 48A (Committee E-18). Philadelphia, PA: American Society for Testing and Materials, 1978., p. 113

Hazardous Substances Data Bank (HSDB)

View More...

4 Toxicity Information

4.1 Toxicity Summary

PAH's such as naphthalene are transported throughout the body after binding blood proteins such as albumin. Binding to the aryl hydrocarbon receptor or glycine N-methyltransferase induces the expression of cytochrome P450 enzymes (especially CYP1A1, CYP1A2, and CYP1B1). These cytochrome enzymes metabolize PAH's into various toxic intermediates (epoxide intermediates, dihydrodiols, phenols, guinones, and their various combinations). The reactive metabolites of PAHs covalently bind to DNA and other cellular macromolecules, initiating mutagenesis and carcinogenesis. (10, 12, 2, 3). In humans, the metabolite alphanaphthol has been linked to the development of hemolytic anemia in some cases following ingestion or extensive dermal or inhalation exposure. Susceptibility appears to be exacerbated by a deficiency in the glucose 6-phosphate dehydrogenase enzyme, or G-6-PD. Over 400 million people have an inherited condition called glucose-6-phosphate dehydrogenase deficiency. Exposure to naphthalene is more harmful for these people and may cause hemolytic anemia at lower doses. Some naphthalene metabolites deplete glutathione stores in affected tissues such as the lungs, leading to toxicity. The metabolites responsible for glutathione depletion have been identified as naphthalene oxide or 1,2-naphthoquinone and 1,4-naphthoquinone.

• Toxin and Toxin Target Database (T3DB)

4.2 Human Toxicity Values

The lethal oral doses determined in cases of accidental poisoning are 5-15 g for adults and 2 g within two days for a six-year old child.

WHO/FAO; Environmental Health Criteria Document No. 202: Selected non-Heterocyclic Polycyclic Aromatic Hydrocarbons (1988). Available from, as of January 23, 2013: https://www.inchem.org/pages/ehc.html

Hazardous Substances Data Bank (HSDB)





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4.3 Non-Human Toxicity Values

LD50 Sprague Dawley rat oral 2.6 g/kg

Papciak RJ, Mallory VT; J Am Coll Toxicol Pt B: Acute Toxicity Data 1 (1): 17 (1990)

Hazardous Substances Data Bank (HSDB)

LD50 New Zealand White rabbit dermal >2.0 g/kg

Papciak RJ, Mallory VY; J Am Coll Toxicol Pt B: Acute Toxicity Data 1 (1): 17 (1990)

Hazardous Substances Data Bank (HSDB)

LD50 Male CD-1 mouse gavage 533 mg/kg

USEPA/ODW; Drinking Water Health Advisories for 15 Volatile Organic Chemicals p. I-7 (1990)

Hazardous Substances Data Bank (HSDB)

LD50 Female CD-1 mouse gavage 710 mg/kg

USEPA/ODW; Drinking Water Health Advisories for 15 Volatile Organic Chemicals p. I-7 (1990)

Hazardous Substances Data Bank (HSDB)

For more Non-Human Toxicity Values (Complete) data for NAPHTHALENE (13 total), please visit the HSDB record page.

Hazardous Substances Data Bank (HSDB)

5.1 Immediately Dangerous to Life or Health (IDLH)

250 ppm (NIOSH, 2024)

• CAMEO Chemicals

250 ppm [From NPG: Naphthalene] (NIOSH, 2024)

CAMEO Chemicals

250.0 [ppm]

Excerpts from Documentation for IDLHs: Human data: The probable oral lethal dose has been reported to be between 5 and 15 grams [Gerarde 1960]. [Note: An oral dose between 5 and 15



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grams is equivalent to a worker being exposed to about 600 to 1,800 ppm for 30 minutes, assuming a breathing rate of 50 liters per minute and 100% absorption.]

Haz-Map, Information on Hazardous Chemicals and Occupational Diseases

250 ppm

NIOSH. NIOSH Pocket Guide to Chemical Hazards. Department of Health & Human Services, Centers for Disease Control & Prevention. National Institute for Occupational Safety & Health. DHHS (NIOSH) Publication No. 2010-168 (2010). Available from: https://www.cdc.gov/niosh/npg

Hazardous Substances Data Bank (HSDB); Occupational Safety and Health Administration (OSHA)

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250 ppm

See: 91203

• The National Institute for Occupational Safety and Health (NIOSH)

5.2 Recommended Exposure Limit (REL)

REL-TWA (Time Weighted Average)

10 ppm (50 mg/m³)

• Occupational Safety and Health Administration (OSHA)

REL-STEL (Short Term Exposure Limit)

15 ppm (75 mg/m³)

Occupational Safety and Health Administration (OSHA)

TWA 10 ppm (50 mg/m³) ST 15 ppm (75 mg/m³)

• The National Institute for Occupational Safety and Health (NIOSH)

5.3 Permissible Exposure Limit (PEL)

10.0 [ppm]

• Haz-Map, Information on Hazardous Chemicals and Occupational Diseases

PEL-TWA (8-Hour Time Weighted Average)

10 ppm (50 mg/m³)

Occupational Safety and Health Administration (OSHA)

TWA 10 ppm (50 mg/m³) See Appendix G

• The National Institute for Occupational Safety and Health (NIOSH)

5.4 Threshold Limit Values (TLV)

10.0 [ppm]

• Haz-Map, Information on Hazardous Chemicals and Occupational Diseases

8 hr Time Weighted Avg (TWA): 10 ppm, skin.

American Conference of Governmental Industrial Hygienists. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. ACGIH, Cincinnati, OH 2014, p. 43

Hazardous Substances Data Bank (HSDB)

View More...

5.5 Effects of Short Term Exposure

The substance may cause effects on the blood. This may result in lesions of blood cells (haemolysis). The effects may be delayed. Ingestion could cause death. Medical observation is indicated.

ILO-WHO International Chemical Safety Cards (ICSCs)

5.6 Effects of Long Term Exposure

The substance may have effects on the blood. This may result in chronic haemolytic anaemia. The substance may have effects on the eyes. This may result in development of cataract. This substance is possibly carcinogenic to humans.

ILO-WHO International Chemical Safety Cards (ICSCs)

5.7 Explosive Limits and Potential

Explosive in the form of vapor or dust when exposed to heat or flame.

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Lewis, R.J. Sr. (ed) Sax's Dangerous Properties of Industrial Materials. 11th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2004., p. 2594

Hazardous Substances Data Bank (HSDB)

LEL of 0.9%, a UEL of 5.9%

Bingham, E.; Cohrssen, B.; Powell, C.H.; Patty's Toxicology Volumes 1-9 5th ed. John Wiley & Sons. New York, N.Y. (2001)., p. V4 335

Hazardous Substances Data Bank (HSDB)

View More...

5.8 Acceptable Daily Intakes

The Ten-day Health Advisory (HA) for the 10 kg child is calculated as ... 0.53 mg/l (rounded to 0.5 mg/l).

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USEPA/ODW; Drinking Water Health Advisories for 15 Volatile Organic Chemicals p. I-13 (1990) NTIS No. PB90-259821

Hazardous Substances Data Bank (HSDB)

The Longer-term Health Advisory (HA) for a 10 kg child is calculated as ... 0.357 mg/l (rounded to 0.4 mg/l). ... The Longer-term Health Advisory for a 70 kg adult is calculated as ... 1.249 mg/l (rounded to 1 mg/l).

USEPA/ODW; Drinking Water Health Advisories for 15 Volatile Organic Chemicals p. I-14 (1990) NTIS No. PB90-259821

Hazardous Substances Data Bank (HSDB)

Oral RfD: 0.02 mg/kg/day (UF: 3,000 MF: 1)

U.S. Environmental Protection Agency's Integrated Risk Information System (IRIS) on Naphthalene (91-20-3). Available from: https://www.epa.gov/iris/index.html on the Substance File List as of July 21, 2003.

Hazardous Substances Data Bank (HSDB)

6 Health and Symptoms

6.1 Physical Dangers

Dust explosion possible if in powder or granular form, mixed with air.

6.2 Chemical Dangers

On combustion, forms irritating and toxic gases. Reacts with strong oxidants. This generates fire and explosion hazard.

ILO-WHO International Chemical Safety Cards (ICSCs)

6.3 Symptoms

Inhalation Exposure

Headache. Weakness. Sweating. Nausea. Vomiting. Further see Ingestion.

ILO-WHO International Chemical Safety Cards (ICSCs)

Skin Exposure

See Inhalation.

ILO-WHO International Chemical Safety Cards (ICSCs)

Eye Exposure

Redness.

ILO-WHO International Chemical Safety Cards (ICSCs)

Ingestion Exposure

Abdominal pain. Diarrhoea. Sweating. Headache. Fever. Jaundice. Weakness. Dark-coloured urine. Symptoms may be delayed.

ILO-WHO International Chemical Safety Cards (ICSCs)

irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage

• The National Institute for Occupational Safety and Health (NIOSH)

Symptoms of hemolytic anemia include fatigue, lack of appetite, restlessness, and pale skin. Exposure to large amounts of naphthalene may cause confusion, nausea, vomiting, diarrhea, blood in the urine, and jaundice (yellow coloration of the skin).





6.4 Evidence for Carcinogenicity

WEIGHT-OF-EVIDENCE CHARACTERIZATION: Using criteria of the 1986 Guidelines for Carcinogen Risk Assessment, naphthalene is classified in group C, a possible human carcinogen. This is based on the inadequate data of carcinogenicity in humans exposed to naphthalene via the oral and inhalation routes, and the limited evidence of carcinogenicity in animals via the inhalation route. Using the 1996 Proposed Guidelines for Carcinogen Risk Assessment, the human carcinogenic potential of naphthalene via the oral or inhalation routes "cannot be determined" at this time based on human and animal data; however, there is suggestive evidence (observations of benign respiratory tumors and one carcinoma in female mice only exposed to naphthalene by inhalation). Additional support includes increase in respiratory tumors associated with exposure to 1-methylnaphthalene. At the present time the mechanism whereby naphthalene produces benign respiratory tract tumors are not fully understood, but are hypothesized to involve oxygenated reactive metabolites produced via the cytochrome P-450 monooxygenase system. However, based on the many negative results obtained in genotoxicity tests, a genotoxic mechanism appears unlikely. HUMAN CARCINOGENICITY DATA: Available data are inadequate to establish a causal association between exposure to naphthalene and cancer in humans. Adequately scaled epidemiological studies designed to examine a possible association between naphthalene exposure and cancer were not located. Overall, no data are available to evaluate the carcinogenic potential in exposed human populations.

U.S. Environmental Protection Agency's Integrated Risk Information System (IRIS). Summary for Naphthalene (91-20-3). Available from, as of March 15, 2000: https://www.epa.gov/iris/

Hazardous Substances Data Bank (HSDB)

A3: Confirmed animal carcinogen with unknown relevance to humans.

American Conference of Governmental Industrial Hygienists. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. ACGIH, Cincinnati, OH 2014, p. 43

Hazardous Substances Data Bank (HSDB)

View More...

6.5 Carcinogen Classification

1 of 2



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IARC Carcinogenic Agent	Naphthalene
IARC Carcinogenic Classes	Group 2B: Possibly carcinogenic to humans
IARC Monographs	Volume 82: (2002) Some Traditional Herbal Medicines, Some Mycotoxins, Naphthalene and Styrene

International Agency for Research on Cancer (IARC)

2 of 2	
Carcinogen Classification	2B, possibly carcinogenic to humans. (L135)

Toxin and Toxin Target Database (T3DB)

6.6 Exposure Routes

The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

ILO-WHO International Chemical Safety Cards (ICSCs)

inhalation, skin absorption, ingestion, skin and/or eye contact

• The National Institute for Occupational Safety and Health (NIOSH)

Oral (L10); inhalation (L10)

L10: ATSDR - Agency for Toxic Substances and Disease Registry (1995). Toxicological profile for PAHs. U.S. Public Health Service in collaboration with U.S. Environmental Protection Agency (EPA). http://www.atsdr.cdc.gov/toxprofiles/tp69.html

• Toxin and Toxin Target Database (T3DB)

6.7 Target Organs

Nervous

Respiratory

• EPA Integrated Risk Information System (IRIS)

Eyes, skin, blood, liver, kidneys, central nervous system





6.8 Fire Hazards

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Excerpt from ERG Guide 133 [Flammable Solids]:

Flammable/combustible material. May be ignited by friction, heat, sparks or flames. Some may burn rapidly with flare-burning effect. Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence. Substance may be transported in a molten form at a temperature that may be above its flash point. May re-ignite after fire is extinguished. (ERG, 2024)

2024 Emergency Response Guidebook, https://www.phmsa.dot.gov/training/hazmat/erg/emergencyresponse-guidebook-erg

CAMEO Chemicals

Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.). Corrosives in contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. For electric vehicles or equipment, ERG Guide 147 (lithium ion or sodium ion batteries) or ERG Guide 138 (sodium batteries) should also be consulted. (ERG, 2024)

2024 Emergency Response Guidebook, https://www.phmsa.dot.gov/training/hazmat/erg/emergencyresponse-guidebook-erg

CAMEO Chemicals

ERG 2024, Guide 133 (Naphthalene, refined)

- · Flammable/combustible material.
- \cdot May be ignited by friction, heat, sparks or flames.
- · Some may burn rapidly with flare-burning effect.
- · Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence.

· Substance may be transported in a molten form at a temperature that may be above its flash point.

 \cdot May re-ignite after fire is extinguished.

Emergency Response Guidebook (ERG)

Combustible. Above 80 °C explosive vapour/air mixtures may be formed. Finely dispersed particles form explosive mixtures in air.

ILO-WHO International Chemical Safety Cards (ICSCs)

6.9 Hazards Summary

Naphthalene is used in the production of **phthalic anhydride**; it is also used in mothballs. Acute (short- term) exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia, damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation and ingestion. Chronic (long-term) exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. Hemolytic anemia has been reported in infants born to mothers who "sniffed" and ingested naphthalene (as mothballs) during pregnancy. Available data are inadequate to establish a causal relationship between exposure to naphthalene and cancer in humans. EPA has classified naphthalene as a Group C, possible human carcinogen.

• EPA Air Toxics

Ingestion of high doses of naphthalene can induce methemoglobinemia and precipitate subacute hemolysis. The lethal dose orally for an adult is 5-15 grams. Workers deficient in **glucose-6-phosphate** dehydrogenase are more susceptible to hemolysis. A 1956 study found cataracts in 8 of 21 workers who melted naphthalene in open vats. After new procedures to reduce exposures, no further cataracts were reported. [ACGIH] Chronic sniffing of naphthalene containing mothballs can cause liver necrosis. [HSDB] Naphthalene is not hepatotoxic in experimental animal studies or in human exposures. [Zimmerman, p. 367] Suspected germ cell mutagen (3B); [MAK]

ACGIH - Documentation of the TLVs and BEIs, 7th Ed. Cincinnati: ACGIH Worldwide, 2020. Zimmerman - Zimmerman HJ. Hepatotoxicity. Philadelphia: Lippincott Williams & Wilkins, 1999., p. 367

Haz-Map, Information on Hazardous Chemicals and Occupational Diseases

6.10 Fire Potential



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Flammable in the presence of a source of ignition, through friction or retained heat.

Sigma-Aldrich; Material Safety Data Sheet for Naphthalene, Product Number: 84679, Version 5.2 (Revision Date 4/12/2013). Available from, as of January 22, 2014: https://www.sigmaaldrich.com/safety-center.html

Hazardous Substances Data Bank (HSDB)

Combustible

International Program on Chemical Safety/Commission of the European Union; International Chemical Safety Card on Naphthalene (April 2005). Available from, as of January 22, 2014: https://www.inchem.org/pages/icsc.html

Hazardous Substances Data Bank (HSDB)

6.11 Skin, Eye, and Respiratory Irritations

Naphthalene can be irritating to the skin.

Mason RT; Naphthalene. Kirk-Othmer Encyclopedia of Chemical Technology (1999-2014). John Wiley & Sons, Inc. Online Posting Date: January 25, 2002

Hazardous Substances Data Bank (HSDB)

Naphthalene vapors are irritating to the eyes and mucous membranes

Dart, R.C. (ed). Medical Toxicology. Third Edition, Lippincott Williams & Wilkins. Philadelphia, PA. 2004., p. 1316

Hazardous Substances Data Bank (HSDB)

7 First Aid

EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. IMMEDIATELY call a hospital or poison control center even if no symptoms (such as redness or irritation) develop. IMMEDIATELY transport the victim to a hospital for treatment after washing the affected areas.

INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. IMMEDIATELY call a physician and be prepared to transport the victim to a hospital even if no symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if

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not available, use a level of protection greater than or equal to that advised under Protective Clothing.

INGESTION: If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. Generally, the induction of vomiting is NOT recommended outside of a physician's care due to the risk of aspirating the chemical into the victim's lungs. However, if the victim is conscious and not convulsing and if medical help is not readily available, consider the risk of inducing vomiting because of the high toxicity of the chemical ingested. Ipecac syrup or salt water may be used in such an emergency. IMMEDIATELY transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

CAMEO Chemicals

Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]:

Refer to the "General First Aid" section. Specific First Aid: For corrosives, in case of contact, immediately flush skin or eyes with running water for at least 30 minutes. Additional flushing may be required. (ERG, 2024)

2024 Emergency Response Guidebook, https://www.phmsa.dot.gov/training/hazmat/erg/emergencyresponse-guidebook-erg

CAMEO Chemicals

ERG 2024, Guide 133 (Naphthalene, refined)

General First Aid:

· Call 911 or emergency medical service.

· Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

 \cdot Move victim to fresh air if it can be done safely.

· Administer oxygen if breathing is difficult.

· If victim is not breathing:

-- DO NOT perform mouth-to-mouth resuscitation; the victim may have ingested or inhaled the substance.

-- If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

-- If no pulse detected or no respiratory medical device available, provide

continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

 \cdot Remove and isolate contaminated clothing and shoes.

· For minor skin contact, avoid spreading material on unaffected skin.

· In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

· For severe burns, immediate medical attention is required.

· Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

 \cdot Keep victim calm and warm.

· Keep victim under observation.

· For further assistance, contact your local Poison Control Center.

 \cdot Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

Specific First Aid:

· Removal of solidified molten material from skin requires medical assistance.

In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

• Emergency Response Guidebook (ERG)

(See general first aid procedures)

Eye: Irrigate immediately - If this chemical contacts the eyes, immediately wash (irrigate) the eyes with large amounts of **water**, occasionally lifting the lower and upper lids. Get medical attention immediately.

Skin: Molten flush immediately/solid-liquid soap wash promptly

Breathing: Respiratory support

Swallow: Medical attention immediately - If this chemical has been swallowed, get medical attention immediately.

• The National Institute for Occupational Safety and Health (NIOSH)

8 Flammability and Explosivity

8.1 Flammable Limits

Lower flammable limit: 0.9% by volume; Upper flammable limit: 5.9% by volume



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National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 325-91

Hazardous Substances Data Bank (HSDB)

Flammability

Combustible Solid, but will take some effort to ignite.

The National Institute for Occupational Safety and Health (NIOSH)

8.2 Lower Explosive Limit (LEL)

0.9 % (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

CAMEO Chemicals

0.9%

Occupational Safety and Health Administration (OSHA); The National Institute for Occupational S...

8.3 Upper Explosive Limit (UEL)

5.9 % (NTP, 1992)

National Toxicology Program, Institute of Environmental Health Sciences, National Institutes of Health (NTP). 1992. National Toxicology Program Chemical Repository Database. Research Triangle Park, North Carolina.

CAMEO Chemicals

5.9%

Occupational Safety and Health Administration (OSHA); The National Institute for Occupational S...

8.4 NFPA Hazard Classification

1 of 2

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NFPA 704 Diamond	2-2-0
NFPA Health Rating	2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.
NFPA Fire Rating	2 - Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air.
NFPA Instability Rating	0 - Materials that in themselves are normally stable, even under fire conditions.

Hazardous Substances Data Bank (HSDB)

8.5 Critical Temperature & Pressure

Critical temperature: 887.4 °F = 475.2 °C = 748.4 K

U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing Office, 1984-5.

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Hazardous Substances Data Bank (HSDB)

Critical pressure: 588 PSI = 40.0 atm = 4.05 megaNewtons/sq m

U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing Office, 1984-5.

Hazardous Substances Data Bank (HSDB)

9 Stability and Reactivity		
9.1 Hazardous Reactivities & Incompatibilities	2 ()	

Strong oxidizers, chromic anhydride

• The National Institute for Occupational Safety and Health (NIOSH)

9.2 Reactivity Profile

Vigorous reactions, sometimes amounting to explosions, can result from the contact between aromatic hydrocarbons, such as NAPHTHALENE, and strong oxidizing agents. They can react exothermically with bases and with diazo compounds. Substitution at the **benzene** nucleus occurs by halogenation (acid catalyst), nitration, sulfonation, and the Friedel-Crafts reaction. Naphthalene, **camphor**, **glycerol**, or turpentine will react violently with **chromic anhydride** [Haz. Chem. Data 1967. p 68]. Friedel-Crafts acylation of naphthalene using **benzoyl chloride**, catalyzed by AlCl3, must be conducted above the melting point of the mixture, or the reaction may be violent [Clar, E. et al., Tetrahedron, 1974, 30, 3296].

CAMEO Chemicals

A mixture containing NAPHTHALENE and METHYLNAPHTHALENES may react vigorously with strong oxidizing agents. Can react exothermically with bases and with diazo compounds. Naphthalene reacts violently with **chromic anhydride** [Haz. Chem. Data 1967. p 68]. Friedel-Crafts acylation of naphthalene using **benzoyl chloride**, catalyzed by AlCl3, must be conducted above the melting point of the mixture, or the reaction may be violent [Clar, E. et al., Tetrahedron, 1974, 30, 3296].

CAMEO Chemicals

9.3 Reactivity Alerts

Highly Flammable

CAMEO Chemicals

10 Storage and Handling		
10.1 Safe Storage	0 Z	

Separated from strong oxidants and food and feedstuffs. Store in an area without drain or sewer access. Provision to contain effluent from fire extinguishing.

ILO-WHO International Chemical Safety Cards (ICSCs)





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Without inert-gas blanketing and at the temperature normally used for the storage of molten naphthalene, i.e., 90 °C, the vapors above the liquid are within the flammability limits. Thus, storage tanks containing molten naphthalene have a combustible mixture in the vapor space and care must be taken to eliminate all sources of ignition around such systems. Naphthalene dust can form explosive mixtures with air which necessitates the design and operation of solid handling systems.

Mason RT; Naphthalene. Kirk-Othmer Encyclopedia of Chemical Technology (1999-2014). John Wiley & Sons, Inc. Online Posting Date: January 25, 2002

Hazardous Substances Data Bank (HSDB)

Store in a cool, dry, well-ventilated location. Separate from oxidizing materials. May be stored under nitrogen gas.

National Fire Protection Association; Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 49-105

Hazardous Substances Data Bank (HSDB)

View More...

10.3 Personal Protective Equipment (PPE)

Excerpt from NIOSH Pocket Guide for Naphthalene:

Skin: PREVENT SKIN CONTACT - Wear appropriate personal protective clothing to prevent skin contact.

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Eyes: PREVENT EYE CONTACT - Wear appropriate eye protection to prevent eye contact.

Wash skin: WHEN CONTAMINATED - The worker should immediately wash the skin when it becomes contaminated.

Remove: WHEN WET OR CONTAMINATED - Work clothing that becomes wet or significantly contaminated should be removed and replaced.

Change: DAILY - Workers whose clothing may have become contaminated should change into uncontaminated clothing before leaving the work premises. (NIOSH, 2024)

CAMEO Chemicals

Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]: Wear positive pressure self-contained breathing apparatus (SCBA). Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE. Structural firefighters' protective clothing provides thermal protection but only limited chemical protection. (ERG, 2024) 2024 Emergency Response Guidebook, https://www.phmsa.dot.gov/training/hazmat/erg/emergencyresponse-guidebook-erg

CAMEO Chemicals

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10.4 Respirator Recommendations

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NIOSH/OSHA

Up to 100 ppm:

(APF = 10) Any air-purifying half-mask respirator with organic vapor cartridge(s) in combination with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100, P100.

Click here for information on selection of N, R, or P filters.*

(APF = 10) Any supplied-air respirator*

Up to 250 ppm:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*

(APF = 50) Any air-purifying full-facepiece respirator equipped with organic vapor cartridge(s) in combination with an N100, R100, or P100 filter.

Click here for information on selection of N, R, or P filters.

(APF = 25) Any powered, air-purifying respirator with an organic vapor cartridge in combination with a high-efficiency particulate filter.*

(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.

Click here for information on selection of N, R, or P filters.

Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

10.5 Nonfire Spill Response

Excerpt from ERG Guide 133 [Flammable Solids]:

ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area. Do not touch or walk through spilled material.

SMALL DRY SPILL: With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

LARGE SPILL: Wet down with **water** and dike for later disposal. Prevent entry into waterways, sewers, basements or confined areas. (ERG, 2024)

2024 Emergency Response Guidebook, https://www.phmsa.dot.gov/training/hazmat/erg/emergencyresponse-guidebook-erg

CAMEO Chemicals

Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]: ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. DO NOT GET WATER INSIDE CONTAINERS. (ERG, 2024)

2024 Emergency Response Guidebook, https://www.phmsa.dot.gov/training/hazmat/erg/emergencyresponse-guidebook-erg

CAMEO Chemicals

11 Cleanup and Disposal

11.1 Spillage Disposal

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

ILO-WHO International Chemical Safety Cards (ICSCs)



<u>[</u>] (?)

11.2 Cleanup Methods

Environmental considerations: Water spill: Use natural barriers or oil spill booms to limit spill travel. Use natural deep water pockets, excavated lagoons, or sand bag barriers to trap material at bottom. Remove trapped material with suction hoses. Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates. /Naphthalene, molten/

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 621

Hazardous Substances Data Bank (HSDB)

Environmental considerations: Water spill: Use natural deep water pockets, excavated lagoons, or sand bag barriers to trap material at bottom. If dissolved, in region of 10 ppm or greater concentration, apply activated carbon at ten times the spilled amount. Remove trapped material with suction hoses. Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates. /Naphthalene, crude or refined/

Association of American Railroads; Bureau of Explosives. Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads, Pueblo, CO. 2005, p. 620

Hazardous Substances Data Bank (HSDB)

View More...

11.3 Disposal Methods

Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U165, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

40 CFR 240-280, 300-306, 702-799 (USEPA); U.S. National Archives and Records Administration's Electronic Code of Federal Regulations. Available from, as of April 6, 2014: https://www.ecfr.gov

Hazardous Substances Data Bank (HSDB)

SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion,



it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

Hazardous Substances Data Bank (HSDB)

View More...

12 Additional Considerations

12.1 Toxic Combustion Products

Hazardous decomposition products formed under fire conditions. - Carbon oxides.

Sigma-Aldrich; Material Safety Data Sheet for Naphthalene, Product Number: 84679, Version 5.2 (Revision Date 4/12/2013). Available from, as of January 22, 2014: https://www.sigmaaldrich.com/safety-center.html

(?) [/]

02

(?) [/]

Hazardous Substances Data Bank (HSDB)

13 Information Sources

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1. Australian Industrial Chemicals Introduction Scheme (AICIS)

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NAPHTHALENE

https://cameochemicals.noaa.gov/chemical/4005

NAPHTHALENE, METHYLNAPHTHALENES https://cameochemicals.noaa.gov/chemical/22439

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https://commonchemistry.cas.org/detail?cas_rn=91-20-3

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Naphthalene [BSI:ISO] https://pubchem.ncbi.nlm.nih.gov/substance/?source=chemidplus&sourceid=0000091203

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1,4-Naphthalenediyl

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https://iris.epa.gov/ChemicalLanding/&substance_nmbr=436

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Naphthalene

https://chem.echa.europa.eu/100.001.863

[No public or meaningful name is available] https://echa.europa.eu/substance-information/-/substanceinfo/100.210.777

Naphthalene (EC: 202-049-5)

https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/50864

685-260-9

https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/215804

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https://www.fda.gov/about-fda/about-website/website-policies#linking

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https://gsrs.ncats.nih.gov/ginas/app/beta/substances/2166IN72UN

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Naphthalene

http://www.hmdb.ca/metabolites/HMDB0029751

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NAPHTHALENE https://www.ilo.org/dyn/icsc/showcard.display?p_version=2&p_card_id=0667

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Naphthalene https://www.cdc.gov/niosh-rtecs/QJ802C8.html

Naphthalene https://www.cdc.gov/niosh/npg/npgd0439.html

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https://haz-map.com/About

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Naphthalene, refined https://pubchem.ncbi.nlm.nih.gov/erg/

19. EPA Air Toxics

LICENSE https://www.epa.gov/privacy/privacy-act-laws-policies-and-resources

Naphthalene https://www.epa.gov/sites/default/files/2016-09/documents/naphthalene.pdf

20. Hazardous Chemical Information System (HCIS), Safe Work Australia

naphthalene http://hcis.safeworkaustralia.gov.au/HazardousChemical/Details?chemicalID=3174

21. NITE-CMC

Naphthalene - FY2009 (Revised classification) https://www.nite.go.jp/chem/english/ghs/09-mhlw-2041e.html Naphthalene - FY2006 (New/original classication) https://www.nite.go.jp/chem/english/ghs/06-imcg-0860e.html Naphthalene - FY2023 (Revised classification) https://www.nite.go.jp/chem/english/ghs/23-jniosh-2037e.html

22. Regulation (EC) No 1272/2008 of the European Parliament and of the Council

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https://monographs.iarc.who.int/list-of-classifications

25. PubChem

https://pubchem.ncbi.nlm.nih.gov



SECTION 1: Identification of the substance/mixture and of the company/undertaking

: Mixture
: Bleach
: 7681-52-9
: VT150

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture

: For laboratory and manufacturing use only

1.3. Details of the supplier of the safety data sheet

Val Tech Diagnostics, A Division of LabChem Inc Jackson's Pointe Commerce Park Building 1000 1010 Jackson's Pointe Court Zelienople, PA 16063 T 412-826-5230 F 724-473-0647

1.4. Emergency telephone number

Emergency number

: CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin Irrit. 2H315Eye Dam. 1H318Aquatic Acute 2H401

Full text of H statements : see section 16

2.2. Label elements	
GHS-US labeling	
Hazard pictograms (GHS-US)	: GHS05
Signal word (GHS-US)	: Danger
Hazard statements (GHS-US)	: H315 - Causes skin irritation H318 - Causes serious eye damage H401 - Toxic to aquatic life
Precautionary statements (GHS-US)	 P264 - Wash exposed skin thoroughly after handling P273 - Avoid release to the environment P280 - Wear protective gloves, protective clothing, eye protection, face protection P302 + P352 - IF ON SKIN: Wash with plenty of soap and water P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P310 - Immediately call a poison center or doctor/physician P332 + P313 - If skin irritation occurs: Get medical advice/attention P362 - Take off contaminated clothing and wash it before reuse P501 - Dispose of contents/container to comply with local, state and federal regulations
2.3. Other hazards	
Other hazards not contributing to the classification	: None.
2.4. Unknown acute toxicity (GHS US)	
No data available	

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 3: Composition/Information on ingredients

3.1. Substance

Not applicable

Full text of H-phrases: see section 16

3.2. Mixture			
Name	Product identifier	%	GHS-US classification
Water	(CAS No) 7732-18-5	94.75	Not classified
Sodium Hypochlorite	(CAS No) 7681-52-9	5.25	Unst. Expl, H200 Ox. Sol. 2, H272 Skin Corr. 1B, H314 STOT SE 3, H335 Aquatic Acute 1, H400

SECTION 4: First aid measures				
4.1. Description of first aid measures	S			
First-aid measures general	 Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). 			
First-aid measures after inhalation	Allow victim to breathe fresh air. Allow the victim to rest.			
First-aid measures after skin contact	: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical advice/attention.			
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.			
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.			
4.2. Most important symptoms and e	effects, both acute and delayed			
Symptoms/injuries after skin contact	: Causes skin irritation.			
Symptoms/injuries after eye contact	: Causes serious eye damage.			
	dical attention and special treatment needed			
No additional information available				
SECTION 5: Firefighting measure	S .			
5.1. Extinguishing media				
Suitable extinguishing media	: Foam. Dry powder. Carbon dioxide. Water spray. Sand.			
Unsuitable extinguishing media : Do not use a heavy water stream.				
5.2. Special hazards arising from the	e substance or mixture			
No additional information available				
5.3. Advice for firefighters				
Firefighting instructions	: Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.			
Protection during firefighting	Do not enter fire area without proper protective equipment, including respiratory protection.			
SECTION 6: Accidental release m	leasures			
6.1. Personal precautions, protective	e equipment and emergency procedures			
6.1.1. For non-emergency personnel				
Protective equipment	: Safety glasses. Protective clothing. Gloves.			
Emergency procedures	: Evacuate unnecessary personnel.			
6.1.2. For emergency responders				
Protective equipment	: Equip cleanup crew with proper protection.			
Emergency procedures	: Ventilate area.			
6.2. Environmental precautions				
Prevent entry to sewers and public waters. N	lotify authorities if liquid enters sewers or public waters. Avoid release to the environment.			
6.3. Methods and material for contai	nment and cleaning up			
Methods for cleaning up	: Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.			

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

6.4.	Reference to other sections
<u> </u>	

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage		
7.1. Precautions for safe handling		
Precautions for safe handling	Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor.	
Hygiene measures	Wash exposed skin thoroughly after handling.	
7.2. Conditions for safe storage, including any incompatibilities		
Storage conditions	: Keep only in the original container in a cool, well ventilated place away from : incompatible materials. Keep container closed when not in use.	
Incompatible products	: Strong reducing agents. combustible materials. aluminum. metals. Ammonia. Strong acids.	
Incompatible materials	: Sources of ignition. Direct sunlight.	

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection Q 1

0.1.	Control	parameters

O = == 1 == 1

- Appropriate engineering controls
- : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.
- Personal protective equipment
- : Safety glasses. Gloves. Protective clothing.



Hand protection	: Wear protective gloves.
Eye protection	: Chemical goggles or safety glasses.
Skin and body protection	: Wear suitable protective clothing.
Respiratory protection	: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended.
Other information	: Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical an	d chemical properties
Physical state	: Liquid
Appearance	: Yellow liquid.
Color	: Yellow.
Odor	: chlorine-like.
Odor threshold	: 0.3 ppm
рН	: 11.5 - 12.5
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: 12 mm Hg
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Solubility	: Soluble in water.

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: No data available
9.2. Other information	
VOC content	: 0%

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Reacts violently with acids. May react violently with reducing agents. Contact with acids liberates toxic gas.

10.4. Conditions to avoid

Incompatible materials. Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong reducing agents. Water. zinc. metals. aluminum. Ammonia. Strong acids.

10.6. Hazardous decomposition products

Hydrogen chloride. Chlorine. Phosgene.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	assified			
Water (7732-18-5)				
LD50 oral rat	00 mg/kg			
Skin corrosion/irritation	es skin irritation.			
	.5 - 12.5			
Serious eye damage/irritation	es serious eye damage.			
	.5 - 12.5			
Respiratory or skin sensitization	assified			
Germ cell mutagenicity	assified			
Carcinogenicity	assified			
Sodium Hypochlorite (7681-52-9)	Sodium Hypochlorite (7681-52-9)			
IARC group	t classifiable			
Reproductive toxicity	assified			
Specific target organ toxicity (single exposure)	assified			
Specific target organ toxicity (repeated exposure)	assified			
Aspiration hazard	assified			
Potential Adverse human health effects and symptoms	on available data, the classification criteria are not me	et.		
Symptoms/injuries after skin contact	es skin irritation.			
Symptoms/injuries after eye contact	es serious eye damage.			

SECTIO	SECTION 12: Ecological information				
12.1.	Toxicity				
Ecology -	water	: Toxic to aquatic life.			
10/13/2016	6	EN (English US)	4/7		

Safety Data Sheet according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Bleach (7681-52-9)	
LC50 fish 1	4.7 mg/l
Sodium Hypochlorite (7681-52-9)	
EC50 Daphnia 1	2.1 mg/l (EC50; 96 h)
LC50 fish 2	0.19 mg/l (LC50; 96 h)
Threshold limit algae 1	0.84 mg/l (EC50; 24 h)
2.2. Persistence and degradability	0.01111.91 (2000; 2111)
Bleach (7681-52-9) Persistence and degradability	Not established.
,	
Sodium Hypochlorite (7681-52-9)	Diadegradability, pat applicable
Persistence and degradability	Biodegradability: not applicable.
Biochemical oxygen demand (BOD) Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable Not applicable
Water (7732-18-5)	Not established
Persistence and degradability	Not established.
2.3. Bioaccumulative potential	
Bleach (7681-52-9)	
Bioaccumulative potential	Not established.
Sodium Hypochlorite (7681-52-9)	
Bioaccumulative potential	Not bioaccumulative.
Water (7732-18-5)	
Bioaccumulative potential	Not established.
lo additional information available 2.5. Other adverse effects	
Other information	: Avoid release to the environment.
SECTION 13: Disposal considerat	tions
3.1. Waste treatment methods	
Vaste disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to comply with local, state and federal regulations.
Ecology - waste materials	: Avoid release to the environment.
SECTION 14: Transport information	on
n accordance with DOT	
n accordance with DOT	
Not regulated for transport	
lot regulated for transport	
	: No supplementary information available.
Not regulated for transport Additional information Dther information	
lot regulated for transport Additional information Other information	
Not regulated for transport Additional information Other information	
lot regulated for transport	
Not regulated for transport Additional information Dther information ADR Transport document description Transport by sea No additional information available	
Not regulated for transport Additional information Other information ADR Transport document description Transport by sea No additional information available Nir transport	
Not regulated for transport Additional information Other information Transport document description Transport by sea No additional information available No additional information available	: No supplementary information available.
lot regulated for transport Additional information Other information ADR Transport document description Transport by sea Io additional information available Air transport Io additional information available SECTION 15: Regulatory information	: No supplementary information available.
lot regulated for transport additional information other information ADR ransport document description fransport by sea lo additional information available air transport lo additional information available SECTION 15: Regulatory information 5.1. US Federal regulations	: No supplementary information available.
lot regulated for transport additional information other information DR ransport document description ransport by sea lo additional information available ir transport lo additional information available SECTION 15: Regulatory information	: No supplementary information available.

Safety Data Sheet

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Bleach (7681-52-9)		
RQ (Reportable quantity, section 304 of EPA's List of Lists)	100 lb	
Sodium Hypochlorite (7681-52-9)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		
RQ (Reportable quantity, section 304 of EPA's List of Lists)	100 lb	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Reactive hazard	
Water (7732-18-5)		
Listed on the United States TSCA (Toxic Substances Control Act) inventory		

15.2. International regulations

CANADA

Bleach (7681-52-9)			
WHMIS Classification	Class E - Corrosive Material		
Sodium Hypochlorite (7681-52-9)			
Listed on the Canadian DSL (Domestic Substances List)			
WHMIS Classification	Class C - Oxidizing Material Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class E - Corrosive Material Class F - Dangerously Reactive Material		
Water (7732-18-5)			
WHMIS Classification Uncontrolled product according to WHMIS classification criteria			

EU-Regulations

Water (7732-18-5)

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

C; R34 R31 N; R50

Full text of R-phrases: see section 16

15.2.2. National regulations

Sodium Hypochlorite (7681-52-9)		
Listed on the Canadian IDL (Ingredient Disclosure List)		
Water (7732-18-5)		

15.3. US State regulations

Bleach(7681-52-9)				
U.S California - Proposition 65 - Carcinogens List		No		
U.S California - Proposition 65 - Developmental Toxicity		No		
U.S California - Proposition 65 - Reproductive Toxicity - Female		No		
U.S California - Proposition 65 - Reproductive Toxicity - Male		No		
Sodium Hypochlorite (7681-	Sodium Hypochlorite (7681-52-9)			
U.S California - Proposition 65 - Carcinogens List	U.S California - Proposition 65 - Developmental Toxicity	U.S California - Proposition 65 - Reproductive Toxicity - Female	U.S California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Water (7732-18-5)				
U.S California - Proposition 65 - Carcinogens List	U.S California - Proposition 65 - Developmental Toxicity	U.S California - Proposition 65 - Reproductive Toxicity - Female	U.S California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

SECTION 16: Other information Other information

: None.

Full text of H-phrases: see section 16:

H200	Unstable explosives
H272	May intensify fire; oxidizer
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation
H400	Very toxic to aquatic life
H401	Toxic to aquatic life

NFPA health hazard	: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
NFPA fire hazard	: 0 - Materials that will not burn.
NFPA reactivity	: 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.
HMIS III Rating	
Health	: 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability	: 0 Minimal Hazard
Physical	: 1 Slight Hazard
Personal protection	: H

SDS US ValTech

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