

### Safety Data Sheet

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

dfmdchemical Co. Date of issue: 10/01/1998 Revision date: 02/28/2018 Supersedes: 01/23/2018 Version: 1.3

### **SECTION 1: Identification**

1.1. Identification

Product form : Substance Substance name : Sulfuric Acid, ACS

CAS-No. : 7664-93-9
Product code : 1.1590
Formula : H2SO4

Synonyms : battery acid / brown acid / brown oil of vitriol / dihydrogen sulfate / dipping acid / electrolyte acid

Not for food, drug or household use

/ nordhausen acid / oil of vitriol / sulphuric acid

1.2. Recommended use and restrictions on use

Use of the substance/mixture : Industrial use

Laboratory chemical Battery: component

Recommended use : Laboratory chemicals

Restrictions on use

1.3. Supplier

NEUTRON PHARMACHEMICAL CO

98, 9th Floor, Borjsaz Building, Azadi Ave, Tehran, Iran.

T 021-66906732-3 - F 021-66581408 info@neutronpharmachemical.com - www.neutronpharmachemical.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 125

### **SECTION 2: Hazard(s) identification**

### 2.1. Classification of the substance or mixture

### **GHS-US** classification

Skin corrosion/irritation, H314 Causes severe skin burns and eye damage.

Category 1A

Serious eye damage/eye H318 Causes serious eye damage.

irritation, Category 1

Full text of H statements : see section 16

### 2.2. GHS Label elements, including precautionary statements

### **GHS-US** labelling

Hazard pictograms (GHS-US) :



GHS05

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H314 - Causes severe skin burns and eye damage.

Precautionary statements (GHS-US) : P260 - Do not breathe mist, vapours, spray.

P264 - Wash exposed skin thoroughly after handling.

P280 - Wear protective gloves, protective clothing, eye protection, face protection. P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Rinse skin with water/shower.

P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. 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/doctor P363 - Wash contaminated clothing before reuse.

P405 - Store locked up.

P501 - Dispose of contents/container to comply with local, state and federal regulations

02/28/2018 EN (English) Page 1

## Safety Data Sheet

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

#### Other hazards which do not result in classification 2.3

Other hazards not contributing to the

classification

#### **Unknown acute toxicity (GHS US)**

Not applicable

### **SECTION 3: Composition/information on ingredients**

### **Substances**

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
Sulfuric Acid, ACS (Main constituent)	(CAS-No.) 7664-93-9	96	Skin Corr. 1A, H314 Eve Dam. 1. H318

Full text of hazard classes and H-statements : see section 16

#### 3.2. **Mixtures**

Not applicable

### **SECTION 4: First-aid measures**

#### **Description of first aid measures**

First-aid measures general

: Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

First-aid measures after inhalation

Remove the victim into fresh air. Immediately consult a doctor/medical service.

First-aid measures after skin contact

: Wash immediately with lots of water (15 minutes)/shower. Do not apply (chemical) neutralizing agents. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

First-aid measures after eye contact

Rinse immediately with plenty of water for 15 minutes. Take victim to an ophthalmologist. Do not apply neutralizing agents. Remove contact lenses, if present and easy to do. Continue

First-aid measures after ingestion

Rinse mouth with water. Do not induce vomiting. Do not give activated charcoal. Immediately consult a doctor/medical service. Call Poison Information Centre (www.big.be/antigif.htm). Take the container/vomit to the doctor/hospital. Ingestion of large quantities: immediately to hospital. Do not give chemical antidote.

#### Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation

: Dry/sore throat. Coughing. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. ON CONTINUOUS EXPOSURE/CONTACT: Corrosion of the upper respiratory tract. FOLLOWING SYMPTOMS MAY APPEAR LATER: Possible laryngeal spasm/oedema. Risk of pneumonia. Risk of lung oedema. Respiratory difficulties.

Symptoms/effects after skin contact

Caustic burns/corrosion of the skin.

Symptoms/effects after eye contact

Corrosion of the eye tissue. Permanent eye damage.

Symptoms/effects after ingestion

Nausea. Abdominal pain. Blood in stool. Blood in vomit. Burns to the gastric/intestinal mucosa.

AFTER INGESTION OF HIGH QUANTITIES: Shock.

Chronic symptoms

: ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Red skin. Dry skin. Itching. Skin rash/inflammation. Affection/discolouration of the teeth. Inflammation/damage of the eye tissue.

### Immediate medical attention and special treatment, if necessary

Obtain medical assistance.

### **SECTION 5: Fire-fighting measures**

### Suitable (and unsuitable) extinguishing media

Suitable extinguishing media

: Quick-acting ABC powder extinguisher. Quick-acting BC powder extinguisher. Quick-acting CO2 extinguisher. Class B foam (alcohol-resistant); after consulting specialist.

Unsuitable extinguishing media

Water (quick-acting extinguisher, reel); risk of puddle expansion. Quick-acting class B foam extinguisher. Water.

#### Specific hazards arising from the chemical 5.2.

Fire hazard

: DIRECT FIRE HAZARD: Non combustible. INDIRECT FIRE HAZARD: Reactions involving a fire hazard: see "Reactivity Hazard".

Explosion hazard

: INDIRECT EXPLOSION HAZARD: Reactions with explosion hazards: see "Reactivity Hazard".

02/28/2018 EN (English) 2/9

### Safety Data Sheet

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

Reactivity

Reacts violently with (some) bases: heat release resulting in increased fire or explosion risk. Reacts with many compounds e.g.: with (strong) reducers, with organic material and with combustible materials: (increased) risk of fire/explosion. Violent exothermic reaction with water (moisture): release of corrosive gases/vapours.

#### 5.3. Special protective equipment and precautions for fire-fighters

Precautionary measures fire

: Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: seal off low-lying areas. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions

Cool tanks/drums with water spray/remove them into safety. When cooling/extinguishing: no

water in the substance. Dilute toxic gases with water spray.

Protection during firefighting

: Heat/fire exposure: compressed air/oxygen apparatus.

### **SECTION 6: Accidental release measures**

### Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Protective equipment

**Emergency procedures** 

: Gloves. Face-shield. Corrosion-proof suit. Large spills/in enclosed spaces: compressed air

apparatus. Large spills/in enclosed spaces: gas-tight suit.

Mark the danger area. No naked flames. Keep containers closed. Avoid ingress of water in the containers. Wash contaminated clothes. Large spills/in confined spaces: consider evacuation. In case of hazardous reactions: keep upwind. In case of reactivity hazard: consider evacuation.

### For emergency responders

Protective equipment **Emergency procedures**  : Equip cleanup crew with proper protection. : Stop leak if safe to do so. Ventilate area.

### **Environmental precautions**

Prevent soil and water pollution. Prevent spreading in sewers.

### Methods and material for containment and cleaning up

For containment

: Contain released product, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Hazardous reaction: measure explosive gas-air mixture. Reaction: dilute combustible gas/vapour with water curtain. Take account of toxic/corrosive precipitation water. Heat exposure: dilute toxic gas/vapour with water spray.

Methods for cleaning up

Take up liquid spill into inert absorbent material, e.g.: dry sand/earth/vermiculite. Scoop absorbed substance into closing containers. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

### Reference to other sections

No additional information available

### **SECTION 7: Handling and storage**

#### 7.1. Precautions for safe handling

Precautions for safe handling

: Keep away from naked flames/heat. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Keep the substance free from contamination. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Never add water to this product. Never dilute by pouring water to the acid. Always add the acid to the water.

Hygiene measures

Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product.

### Conditions for safe storage, including any incompatibilities

Incompatible products

: Strong bases. metals. combustible materials.

Heat and ignition sources

: KEEP SUBSTANCE AWAY FROM: heat sources.

Prohibitions on mixed storage

: KEEP SUBSTANCE AWAY FROM: combustible materials. reducing agents. (strong) bases. highly flammable materials. metals. cellulosic materials. organic materials. alcohols. amines. water/moisture.

Storage area

Store in a dry area. Ventilation at floor level. Keep locked up. Provide for a tub to collect spills.

Unauthorized persons are not admitted. Meet the legal requirements.

Special rules on packaging

SPECIAL REQUIREMENTS: closing. dry. clean. correctly labelled. meet the legal

requirements. Secure fragile packagings in solid containers.

02/28/2018 EN (English) 3/9

## Safety Data Sheet

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

Packaging materials

: SUITABLE MATERIAL: stainless steel. carbon steel. polyethylene. polypropylene. glass. stoneware/porcelain. MATERIAL TO AVOID: monel steel. lead. copper. zinc.

### SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Sulfuric Acid, ACS (7664-93-9)		
ACGIH	ACGIH TWA (mg/m³)	0.2 mg/m³ (Thoracic fraction)
OSHA	OSHA PEL (TWA) (mg/m³)	1 mg/m³
IDLH	US IDLH (mg/m³)	15 mg/m³
NIOSH	NIOSH REL (TWA) (mg/m³)	1 mg/m³

### 8.2. Appropriate engineering controls

Appropriate engineering controls

: Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.

### 8.3. Individual protection measures/Personal protective equipment

#### Personal protective equipment:

Gloves. Face shield. Chemical resistant apron. Safety glasses. Protective goggles. Gas mask with filter type E.











#### Materials for protective clothing:

GIVE EXCELLENT RESISTANCE: butyl rubber. polyethylene. tetrafluoroethylene. GIVE LESS RESISTANCE: neoprene. PVC. viton. GIVE POOR RESISTANCE: natural rubber. nitrile rubber. PVA

### Hand protection:

Gloves

### Eye protection:

Face shield

Melting point

### Skin and body protection:

Corrosion-proof clothing

### Respiratory protection:

Full face mask with filter type E at conc. in air > exposure limit

### **SECTION 9: Physical and chemical properties**

### 9.1. Information on basic physical and chemical properties

Physical state : Liquid
Appearance : Liquid.

Colour : Pure substance: colourless Unpurified: yellow to brown

: 10 °C

Freezing point : No data available

Boiling point : 288 °C
Flash point : Not applicable
Relative evaporation rate (butylacetate=1) : No data available
Flammability (solid, gas) : No data available

02/28/2018 EN (English) 4/9

## Safety Data Sheet

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

Vapour pressure : <1 hPa (20 °C)

Relative vapour density at 20 °C : 3.4
Relative density : 1.8

Density :  $1840 \text{ kg/m}^3$  Molecular mass : 98.08 g/mol

Solubility : Exothermically soluble in water. Soluble in ethanol.

Water: complete

Log Pow : -2.2 (Estimated value)
Auto-ignition temperature : No data available

Decomposition temperature : > 340 °C

Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive limits : No data available
Explosive properties : No data available.
Oxidising properties : No data available.

9.2. Other information

VOC content : 0 %

Other properties : Gas/vapour heavier than air at 20°C. Clear. Hygroscopic. Slightly volatile. Substance has acid

reaction.

### **SECTION 10: Stability and reactivity**

### 10.1. Reactivity

Reacts violently with (some) bases: heat release resulting in increased fire or explosion risk. Reacts with many compounds e.g.: with (strong) reducers, with organic material and with combustible materials: (increased) risk of fire/explosion. Violent exothermic reaction with water (moisture): release of corrosive gases/vapours.

#### 10.2. Chemical stability

Unstable on exposure to moisture.

### 10.3. Possibility of hazardous reactions

Reacts violently with water. Reacts violently with (some) bases: release of heat.

### 10.4. Conditions to avoid

Incompatible materials. Moisture.

### 10.5. Incompatible materials

Water. Strong bases. Organic compounds. metals. Halogens. cyanides. combustible materials.

### 10.6. Hazardous decomposition products

Sulfur compounds.

### **SECTION 11: Toxicological information**

### 11.1. Information on toxicological effects

Likely routes of exposure : Skin and eyes contact

Acute toxicity : Not classified

Sulfuric Acid, ACS (7664-93-9)	
LD50 oral rat	2140 mg/kg bodyweight (Rat, Experimental value)
ATE US (oral)	2140 mg/kg bodyweight
Skin corrosion/irritation	: Causes severe skin burns and eye damage.
	pH: < 1
Serious eye damage/irritation	: Causes serious eye damage.
	pH: < 1
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified

02/28/2018 EN (English) 5/9

## Safety Data Sheet

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

Sulfuric Acid, ACS (7664-93-9)	
Additional information	Strong inorganic acid mists containing sulfuric acid are carcinogenic to humans
National Toxicology Program (NTP) Status	2 - Known Human Carcinogens
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
Potential adverse human health effects and symptoms	: Odour threshold is well above the exposure limit. Causes severe skin burns. Irritant to the respiratory organs. Causes serious eye damage.
Symptoms/effects after inhalation	: Dry/sore throat. Coughing. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. ON CONTINUOUS EXPOSURE/CONTACT: Corrosion of the upper respiratory tract. FOLLOWING SYMPTOMS MAY APPEAR LATER: Possible laryngeal spasm/oedema. Risk of pneumonia. Risk of lung oedema. Respiratory difficulties.
Symptoms/effects after skin contact	: Caustic burns/corrosion of the skin.
Symptoms/effects after eye contact	: Corrosion of the eye tissue. Permanent eye damage.
Symptoms/effects after ingestion	: Nausea. Abdominal pain. Blood in stool. Blood in vomit. Burns to the gastric/intestinal mucosa. AFTER INGESTION OF HIGH QUANTITIES: Shock.
Chronic symptoms	: ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Red skin. Dry skin. Itching. Skin rash/inflammation. Affection/discolouration of the teeth. Inflammation/damage of the eye tissue.

Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008.
: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).
: Harmful to crustacea. Harmful to fishes. Groundwater pollutant. Mild water pollutant (surface water). Inhibition of activated sludge. pH shift. Toxic to plankton.
42 mg/l (96 h, Gambusia affinis)
29 mg/l (24 h, Daphnia magna)

### Persistence and degradability

Sulfuric Acid, ACS (7664-93-9)	
Persistence and degradability	Biodegradability: not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

### **Bioaccumulative potential**

Sulfuric Acid, ACS (7664-93-9)	
Log Pow	-2.2 (Estimated value)
Bioaccumulative potential	Not bioaccumulative.

#### 12.4. **Mobility in soil**

No additional information available

### Other adverse effects

No additional information available

### **SECTION 13: Disposal considerations**

### **Disposal methods**

Regional legislation (waste) : LWCA (the Netherlands): KGA category 01.

EN (English) 02/28/2018 6/9

## Safety Data Sheet

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

Waste disposal recommendations

: Treat using the best available techniques before discharge into drains or the aquatic environment. Use appropriate containment to avoid environmental contamination. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle/reuse. Remove to an authorized dump (Class I). Remove for physico-chemical/biological treatment.

Additional information

: Hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No

1357/2014 and Regulation (EU) No 2017/997.

Ecology - waste materials : Avoid release to the environment.

### **SECTION 14: Transport information**

### **Department of Transportation (DOT)**

In accordance with DOT

Transport document description : UN1830 Sulfuric acid (with more than 51 percent acid), 8, II

UN-No.(DOT) : UN1830
Proper Shipping Name (DOT) : Sulfuric acid

with more than 51 percent acid

Transport hazard class(es) (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

: 202

Packing group (DOT) : II - Medium Danger Hazard labels (DOT) : 8 - Corrosive



DOT Packaging Non Bulk (49 CFR 173.xxx) DOT Packaging Bulk (49 CFR 173.xxx) DOT Special Provisions (49 CFR 172.102)

: 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.

A7 - Steel packagings must be corrosion-resistant or have protection against corrosion.
B3 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks and DOT 57 portable tanks are not authorized.

B83 - Bottom outlets are prohibited on tank car tanks transporting sulfuric acid in concentrations over 65.25 percent.

B84 - Packagings must be protected with non-metallic linings impervious to the lading or have a suitable corrosion allowance for sulfuric acid or spent sulfuric acid in concentration up to 65.25 percent.

IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.

N34 - Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous material.

T8 - 4 178.274(d)(2) Normal...... Prohibited

TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.

TP12 - This material is considered highly corrosive to steel.

DOT Packaging Exceptions (49 CFR 173.xxx) : 154
DOT Quantity Limitations Passenger aircraft/rail : 1 L

(49 CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : 30 L

CFR 175.75)

DOT Vessel Stowage Location : C - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel.

02/28/2018 EN (English) 7/9

## Safety Data Sheet

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

DOT Vessel Stowage Other : 14 - For metal drums, stowage permitted under deck on cargo vessels

Other information : No supplementary information available.

## **SECTION 15: Regulatory information**

### 15.1. US Federal regulations

Sulfuric Acid, ACS (7664-93-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory  Not subject to reporting requirements of the United States SARA Section 313  Subject to reporting requirements of United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	1000 lb
SARA Section 311/312 Hazard Classes	Health hazard - Skin corrosion or Irritation Health hazard - Serious eye damage or eye irritation

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Sulfuric Acid, ACS	CAS-No. 7664-93-9	100%
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### 15.2. International regulations

#### **CANADA**

No additional information available

### **EU-Regulations**

No additional information available

### **National regulations**

### Sulfuric Acid, ACS (7664-93-9)

Listed on IARC (International Agency for Research on Cancer) Listed as carcinogen on NTP (National Toxicology Program)

### 15.3. US State regulations

NFPA specific hazard

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

### **SECTION 16: Other information**

Revision date : 02/28/2018

Full text of H-statements: see section 16:

H318 Causes serious eye damage.	H314	Causes severe skin burns and eye damage.
	H318	Causes serious eye damage.

: W - Materials that react violently or explosively with water.

NFPA health hazard

: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard

: 0 - Materials that will not burn under typical dire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity

: 2 - Materials that readily undergo violent chemical change at elevated temperatures and pressures.



02/28/2018 EN (English) 8/9

## Safety Data Sheet

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

Hazard Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is

given

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at

normal temperature and pressure with low risk for explosion. Materials may react violently with

water or form peroxides upon exposure to air.

Personal protection : I

H - Splash goggles, Gloves, Synthetic apron, Vapor respirator

SDS US LabChem

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02/28/2018 EN (English) 9/9