1: Identification

Product identifier

Product name: Ammonium sulfide solution

Stock number: 33286
CAS Number: 12135-76-1
EC number: 235-223-4

Relevant identified uses of the substance or mixture and uses advised against.
Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2: Hazard(s) identification

Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

GHS02 Flame
Flam. Liq. 3 H226 Flammable liquid and vapour.

GHS05 Corrosion
Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

C; Corrosive
R34: Causes burns.

I; Dangerous for the environment
R50: Very toxic to aquatic organisms.

R10-31: Flammable. Contact with acids liberates toxic gas.

Information concerning particular hazards for human and environment: Not applicable

Hazards not otherwise classified
No information known.

Label elements

Labelling according to Regulation (EC) No 1272/2008 The substance is classified and labeled according to the CLP regulation.

Hazard pictograms

GHS02 GHS05

Signal word Danger

Hazard statements
H226 Flammable liquid and vapour.
H314 Causes severe skin burns and eye damage.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification
B3 - Combustible liquid
D1B - Toxic material causing immediate and serious toxic effects
D2B - Toxic material causing other toxic effects
E - Corrosive material

Classification system

HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

Health (acute effects) = 3
Flammability = 3
Physical Hazard = 2

Other hazards

Results of PBT and vPvB assessment
PBT: Not applicable.
Product name: Ammonium sulfide solution

3: Composition/information on ingredients

Chemical characterization: Substances
CAS® Description: 12135-76-1 Ammonium sulfide solution
EC number: 235-223-4

4: First-aid measures

Description of first aid measures
General information: Immediately remove any clothing soiled by the product.
After inhalation: Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.
After skin contact: Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.
After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing: Seek medical treatment.

Information for doctor
Most important symptoms and effects, both acute and delayed: Causes severe skin burns. Causes serious eye damage.
Indication of any immediate medical attention and special treatment needed: None.

5: Fire-fighting measures

Extinguishing media
Suitable extinguishing agents: Water haze
For safety reasons unsuitable extinguishing agents: Carbon dioxide
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
- Nitrogen oxides (NOx)
- Sulfur oxides (SOx)
- Ammonia
- Hydrogen sulfide

Advice for firefighters
Protective equipment:
- Wear self-contained respirator.
- Wear fully protective impervious suit.

6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Environmental precautions:
- Do not allow material to be released to the environment without proper governmental permits.
- Do not allow product to reach sewage system or any water course.
- Do not allow to penetrate the ground/soil.

Methods and material for containment and cleaning up:
- Keep away from ignition sources.
- Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
- Use neutralizing agent.
- Disposal of contaminated material as waste according to section 13. Ensure adequate ventilation.

Prevention of secondary hazards: Keep away from ignition sources. See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information.

7: Handling and storage

Handling
Precautions for safe handling:
- Keep container tightly sealed.
- Store in cool, dry place in tightly closed containers.
- Ensure good ventilation at the workplace.
- Prevent formation of aerosols.

Information about protection against explosions and fires:
- Keep ignition sources away.
- Protect against electrostatic charges.
- Fumes can combine with air to form an explosive mixture.

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:
- Do not store together with acids.
- Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions:
- Keep container tightly sealed.
- Store in cool, dry conditions in well sealed containers.

Specific end use(s): No further relevant information available.
8: Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

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

Additional information:

Exposure controls

Personal protective equipment

General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin. Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition. The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Penetration time of glove material (in minutes) Not determined

Eye protection:

Tightly sealed goggles

Full face protection

Body protection: Protective work clothing.

9: Physical and chemical properties

Information on basic physical and chemical properties

General information

Appearance:
Form: Liquid
Color: Colorless to orange
Odor: Like rotten eggs
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined

Flash point: 60 °C (140 °F)

Flammability (solid, gaseous) Not applicable.

Ignition temperature: Not determined

Decomposition temperature: Not determined

Auto igniting: Not determined.

Danger of explosion: Not determined.

Explosion limits:
Lower: Not determined
Upper: Not determined

Vapor pressure at 20 °C (68 °F): 546 hPa (410 mm Hg)

Density at 20 °C (68 °F): 0.997 g/cm³ (8.32 lbs/gal)

Relative density Not determined.

Vapor density Not determined.

Evaporation rate Not determined.

Solubility in / Miscibility with Water: Fully miscible

Partition coefficient (n-octanol/water): Not determined.

Viscosity:
dynamic: Not determined.

kinematic: Not determined.

Other information No further relevant information available.

10: Stability and reactivity

Reactivity Contact with acids liberates toxic gas.

Chemical stability Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions
Reacts with acids forming hydrogen sulfide
Water reacts violently with alkali metals.
Reacts with alkaline earth metals.
Reacts with strong oxidizing agents
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Conditions to avoid No further relevant information available.

Incompatible materials:
Aluminum/aluminum alloys.
Copper
Acids

Hazardous decomposition products:
Hydrogen sulfide
Sulfur oxides (SOx)
Ammonia
Nitrogen oxides (NOx)

11: Toxicological information

Information on toxicological effects

Acute toxicity: Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.

LD/LC50 values that are relevant for classification: No data

(Contd. on page 4)
Product name: Ammonium sulfide solution

Skin irritation or corrosion: Causes severe skin burns.
Eye irritation or corrosion: Causes serious eye damage.
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: No effects known.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: No effects known.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12: Ecological information
Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.
Ecotoxicity:
Remark: Very toxic for aquatic organisms
Additional ecological information:
General notes:
Do not allow product to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.
Danger to drinking water if even small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Avoid transfer into the environment.
Very toxic for aquatic organisms
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 Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14: Transport information
UN-Number
DOT, IMDG, IATA
UN2683
UN proper shipping name
DOT
RQ Ammonium sulfide solution
IMDG, IATA
AMMONIUM SULPHIDE SOLUTION
Transport hazard class(es)
DOT
Class 8 Corrosive substances.
Label 8+6.1+3
Class 8 (CFT) Corrosive substances
Label 8+6.1+3
IMDG, IATA
Class 8 Corrosive substances.
Label 8+6.1+3
Packing group II
Environmental hazards: Environmentally hazardous substance, liquid
Special precautions for user Warning: Corrosive substances
Segregation groups Ammonium compounds, alkalis
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.
Transport/Additional information:
DOT
Hazardous substance: 100 lbs, 45.4 kg
Marine Pollutant (DOT): No
UN "Model Regulation": UN2683, Ammonium sulfide solution, 8 (6.1+3), II

15: Regulatory information
Safety, health and environmental regulations/legislation specific for the substance or mixture
National regulations:
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
SARA Section 313 (specific toxic chemical listings) Substance is not listed.
California Proposition 65
Prop 65 - Chemicals known to cause cancer Substance is not listed.
Prop 65 - Developmental toxicity Substance is not listed.
Prop 65 - Developmental toxicity, female Substance is not listed.

(Contd. of page 3)
Prop 65 - Developmental toxicity, male Substance is not listed.

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. Substance is not listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

Substance is not listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed.

REACH - Pre-registered substances Substance is listed.

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

16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Abbreviations and acronyms:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the “International Air Transport Association” (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical instructions by the “International Civil Aviation Organization” (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)