1 Identification

Product identifier

Product name: 1,4-Difluorobenzene

Stock number: A16217, L00734
CAS Number: 540-36-3
EC number: 208-742-9

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
Thermo Fisher Scientific Chemicals, 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 in accordance with 29 CFR 1910 (OSHA HCS)

GHS02 Flame
Flam. Liq. 2 H225 Highly flammable liquid and vapor.

GHS07
Eye Irrit. 2A H319 Causes serious eye irritation.

Hazard not otherwise classified No information known.

Label elements

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Signal word Danger

Hazard statements
H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P233 Keep container tightly closed.
P243 Take precautionary measures against static discharge.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

WHMIS classification
B2 - Flammable liquid
D2B - Toxic material causing other toxic effects

Classification system

HMIS ratings (scale 0-4)

HEALTH

Health (acute effects) = 1

Flammability = 3

Physical Hazard = 1

Other hazards

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

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:
540-36-3 1,4-Difluorobenzene
Identification number(s):
EC number: 208-742-9

4 First-aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

(Contd. on page 2)
5 Fire-fighting measures

- Extinguishing media
  - Suitable extinguishing agents: CO2, sand, extinguishing powder. Do not use water.

- Special hazards arising from the substance or mixture
  - If this product is involved in a fire, the following can be released:
    - Carbon monoxide and carbon dioxide
    - Hydrogen fluoride (HF)

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
  - Wear protective equipment. Keep unprotected persons away.
  - Ensure adequate ventilation.
  - Keep away from ignition sources.

Environmental precautions:

- Do not allow material to be released to the environment without proper governmental permits.

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).
- Ensure adequate ventilation.

Prevention of secondary hazards:

- Keep away from ignition sources.

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.

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.

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

- Conditions for safe storage, including any incompatibilities

- Storage
  - Requirements to be met by storerooms and receptacles:
    - Store in a cool location.
  - Information about storage in one common storage facility:
    - Store away from oxidizing agents.

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:
  - No data

- 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.
      - Do not inhale gases / fumes / aerosols.
      - Avoid contact with the eyes.
      - 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.

- Eye protection:
  - Safety glasses

- Body protection:
  - Protective work clothing.

9 Physical and chemical properties

- Information on basic physical and chemical properties
  - General Information
    - Appearance:
      - Form: Liquid
      - Color: Colorless
      - Odor: Characteristic

(Contd. on page 3)
Product: 1,4-Difluorobenzene

38.0.2 Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
- Melting point/Melting range: -13 °C (9 °F)
- Boiling point/Boiling range: 88-89 °C (190-192 °F)

Sublimation temperature / start: Not determined

Flash point: 2 °C (36 °F)

Flammability (solid, gaseous): Not determined.

Ignition temperature: Not determined.

Decomposition temperature: Not determined.

Auto igniting: Not determined.

Danger of explosion: Product is not explosive. However, formation of explosive air/vapor mixtures is possible.

Explosion limits:
- Lower: Not determined
- Upper: Not determined

Vapor pressure: Not determined.

Density at 20 °C (68 °F): 1.166 g/cm³ (9.73 lbs/gal)

Relative density: Not determined.

Vapor density: Not determined.

Evaporation rate: Not determined.

Solubility in / Miscibility with
- Water at 20 °C (68 °F): 1.2 g/l

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: No information known.

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: No dangerous reactions known.

Conditions to avoid: No further relevant information available.

Incompatible materials: Oxidizing agents.

Hazardous decomposition products: Carbon monoxide and carbon dioxide.

11 Toxicological information

Information on toxicological effects:
- Acute toxicity: No effects known.
- LD/LC50 values that are relevant for classification: No data.
- Skin irritation or corrosion: May cause irritation.
- Eye irritation or corrosion: Causes serious eye irritation.
- 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.

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: The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:
- Brain and Coverings - recordings from specific areas of CNS.

Additional toxicological information:
- To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
- Vapors have narcotic effect.

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.

Additional ecological information:
- General notes: Do not allow material to be released to the environment without proper governmental permits. Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment.

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.

14 Transport information

UN-Number: UN1993

DOT, IMDG, IATA: USA
Product name: 1,4-Difluorobenzene

UN proper shipping name
DOT
IMDG, IATA Flammable liquids, n.o.s. (1,4-Difluorobenzene)

Transport hazard class(es)

DOT

Class
3 Flammable liquids.

Label
3

IMDG, IATA

Class
3 Flammable liquids.

Label
3

Packing group
DOT, IMDG, IATA II

Environmental hazards:
Not applicable.

Special precautions for user
Warning: Flammable liquids

EMS Number:
F-E,S-E

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

Transport/Additional information:

DOT

Marine Pollutant (DOT):
No

UN "Model Regulation":
UN1993, Flammable liquids, n.o.s., special provision 640D (1,4-Difluorobenzene), 3, II

15 Regulatory information

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

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

GHS02 GHS07

Signal word Danger

Hazard statements
H225 Highly flammable liquid and vapor. H319 Causes serious eye irritation.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P333 Do not breathe dust/fume/gas/mist/vapours/spray.
P332 Keep container tightly closed.
P333+P343 Take precautionary measures against static discharge.
P361+P363 Keep out of reach of children.
P364+P365 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

National regulations
This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.

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, male Substance is not listed.
Prop 65 - Developmental toxicity, female 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.

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

Date of preparation / last revision 11/23/2015 -

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
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
Product name: 1,4-Difluorobenzene

(Contd. of page 4)