1 Identification

Product identifier

Product name: 2-Fluoroethanol

Stock number: L01735
CAS Number: 71-62-0
EC number: 206-740-2

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. 3 H226 Flammable liquid and vapour.

- GHS06 Skull and crossbones
  - Acute Tox. 1 H300 Fatal if swallowed.
  - Acute Tox. 1 H310 Fatal in contact with skin.
  - Acute Tox. 1 H330 Fatal if inhaled.

Hazards 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)

Hazard pictograms

GHS02 GHS06

Signal word: Danger

Hazard statements

- H226 Flammable liquid and vapour.
- H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.

Precautionary statements

- P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
- P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P305 Specific treatment is urgent (see on this label).
- P361 Take off immediately all contaminated clothing.
- P405 Store locked up.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification

B2 - Flammable liquid
D1A - Very toxic material causing immediate and serious toxic effects

Classification system

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

- Health (acute effects) = 4
- 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: 371-62-0 2-Fluoroethanol

Identification number(s):
EC number: 206-740-2

(Contd. on page 2)
4 First-aid measures

Description of first aid measures

General information
Immediately remove any clothing soiled by the product. Remove breathing apparatus only after contaminated clothing has been completely removed. In case of irregular breathing or respiratory arrest provide artificial respiration.

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
Do not induce vomiting; immediately call for medical help.

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
Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

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). Dispose of contaminated material as waste according to section 13. 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. Open and handle container with care.

Information about protection 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: No special requirements.
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. Store protective clothing separately. Avoid contact with the eyes and skin. Maintain an ergonomically appropriate working environment.

Breathing equipment:
Use self-contained respiratory protective device in emergency situations.

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

USA
Product name: 2-Fluoroethanol

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: Not determined.
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: -27 °C (-17 °F)
Boiling point/Boiling range: 102-104 °C (216-219 °F)
Sublimation temperature / start: Not determined.

Flash point: 31 °C (88 °F)
Flammability (solid, gaseous): Not determined.
Ignition temperature: Not determined.
Decomposition temperature: Not determined.
Auto ignition: 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 at 20 °C (68 °F): 28 hPa (21 mm Hg)
Density at 20 °C (68 °F): 1.104 g/cm³ (9.213 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 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
Hydrogen fluoride

11 Toxicological information

Information on toxicological effects

Acute toxicity:
Fatal in contact with skin.
Fatal if swallowed.
Fatal if inhaled.

Danger through skin absorption.

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

Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: May cause 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.

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:
The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:

Behavioral - coma.
Lungs, Thorax, or Respiration - respiratory stimulation.
Gastrointestinal - changes in structure or function of salivary glands.

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.

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.

Avoid transfer into the environment.

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.
38.0.2 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

<table>
<thead>
<tr>
<th>UN-Number</th>
<th>DOT, IMDG, IATA</th>
<th>UN3384</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name DOT</td>
<td>Toxic by inhalation liquid, flammable, n.o.s. (2-Fluoroethanol)</td>
<td></td>
</tr>
<tr>
<td>IMDG</td>
<td>TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. (2-Fluoroethanol)</td>
<td></td>
</tr>
<tr>
<td>IATA</td>
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<td></td>
</tr>
</tbody>
</table>

Transport hazard class(es)

- **DOT**
  - Class: 6.1 Toxic substances.
  - Label: 6.1+3

- **IMDG, IATA**
  - Class: 6.1 Toxic substances.
  - Label: 6.1+3

Packing group

- **DOT, IMDG, IATA**
  - I

Environmental hazards:
Not applicable.

Special precautions for user

- **Poison inhalation hazard:** Warning: Toxic substances
  - Yes

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

Transport/Additional information:

- **Marine Pollutant (DOT):** No
- **Remarks:** This material is poisonous by inhalation in Hazard Zone B.

15 Regulatory information

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

<table>
<thead>
<tr>
<th>GHS label elements</th>
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Hazard pictograms

- GHS02
- GHS06

Signal word Danger

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- P320 Specific treatment is urgent (see on this label).
- P361 Take off immediately all contaminated clothing.
- P405 Store locked up.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Environmental hazards:
Not applicable.

Special precautions for user

- **Poison inhalation hazard:** Warning: Toxic substances
  - Yes

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

Transport/Additional information:

- **Marine Pollutant (DOT):** No
- **Remarks:** This material is poisonous by inhalation in Hazard Zone B.

UN "Model Regulation":

- UN3384. Toxic by inhalation liquid, flammable, n.o.s. (2-Fluoroethanol), 6.1 (3), I

National regulations

- All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
- All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL).
- **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.
  - Prop 65 - Developmental toxicity, male Substance is not listed.
- **Information about limitation of use:**
  - For use only by technically qualified individuals. This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.
- **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.
Product name: 2-Fluoroethanol

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
IATA-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
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
WHMIS: Workplace Hazardous Materials Information System (Canada)
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)