

## 1 Identification

### Product identifier

**Product name:** 4-Fluorothiophenol, water <7%

**Stock number:** A17600, L10029

**CAS Number:**

371-42-6

**EC number:**

206-737-6

**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. 2 H300 Fatal if swallowed.

Acute Tox. 2 H310 Fatal in contact with skin.

Acute Tox. 3 H331 Toxic if inhaled.



GHS07

Skin Irrit. 2 H315 Causes skin irritation.

Eye Irrit. 2A H319 Causes serious eye irritation.

Skin Sens. 1 H317 May cause an allergic skin reaction.

STOT SE 3 H335 May cause respiratory irritation.

**Hazards not otherwise classified**

No information known.

Stench

### 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

### Hazard statements

H226 Flammable liquid and vapour.

H300+H310 Fatal if swallowed or in contact with skin.

H331 Toxic if inhaled.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H317 May cause an allergic skin reaction.

H335 May cause respiratory irritation.

### Precautionary statements

P280 Wear protective gloves / protective clothing.

P262 Do not get in eyes, on skin, or on clothing.

P273 Avoid release to the environment.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P309+P311 IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

### WHMIS classification

B3 - Combustible liquid

D1A - Very toxic material causing immediate and serious toxic effects

D2B - Toxic material causing other toxic effects



### Classification system

### HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH **3** Health (acute effects) = 3

FIRE **2** Flammability = 2

REACTIVITY **1** Physical Hazard = 1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |
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| <b>Product name: 4-Fluorothiophenol, water &lt;7%</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |
| <b>Other hazards</b><br><b>Results of PBT and vPvB assessment</b><br><b>PBT:</b> Not applicable.<br><b>vPvB:</b> Not applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (Contd. of page 1) |
| <b>3 Composition/information on ingredients</b><br><b>Chemical characterization: Substances</b><br><b>CAS# Description:</b><br>371-42-6 4-Fluorothiophenol, water <7%<br><b>Identification number(s):</b><br><b>EC number:</b> 206-737-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |
| <b>4 First-aid measures</b><br><b>Description of first aid measures</b><br><b>General information</b><br>Immediately remove any clothing soiled by the product.<br>Remove breathing apparatus only after contaminated clothing has been completely removed.<br>In case of irregular breathing or respiratory arrest provide artificial respiration.<br><b>After inhalation</b><br>Supply fresh air. If required, provide artificial respiration. Keep patient warm.<br>Seek immediate medical advice.<br><b>After skin contact</b><br>Immediately wash with water and soap and rinse thoroughly.<br>Seek immediate medical advice.<br><b>After eye contact</b> Rinse opened eye for several minutes under running water. Then consult a doctor.<br><b>After swallowing</b> Do not induce vomiting; immediately call for medical help.<br><b>Information for doctor</b><br><b>Most important symptoms and effects, both acute and delayed</b> No further relevant information available.<br><b>Indication of any immediate medical attention and special treatment needed</b> No further relevant information available. |                    |
| <b>5 Fire-fighting measures</b><br><b>Extinguishing media</b><br><b>Suitable extinguishing agents</b> CO2, sand, extinguishing powder. Do not use water.<br><b>Special hazards arising from the substance or mixture</b><br>If this product is involved in a fire, the following can be released:<br>Carbon monoxide and carbon dioxide<br>Hydrogen fluoride (HF)<br>Sulfur oxides (SOx)<br>Hydrogen sulfide<br><b>Advice for firefighters</b><br><b>Protective equipment:</b><br>Wear self-contained respirator.<br>Wear fully protective impervious suit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |
| <b>6 Accidental release measures</b><br><b>Personal precautions, protective equipment and emergency procedures</b><br>Wear protective equipment. Keep unprotected persons away.<br><b>Ensure adequate ventilation</b><br><b>Environmental precautions:</b> Do not allow material to be released to the environment without proper governmental permits.<br><b>Methods and material for containment and cleaning up:</b><br>Keep away from ignition sources.<br>Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).<br>Dispose of contaminated material as waste according to section 13.<br><b>Ensure adequate ventilation.</b><br><b>Prevention of secondary hazards:</b> No special measures required.<br><b>Reference to other sections</b><br>See Section 7 for information on safe handling<br>See Section 8 for information on personal protection equipment.<br>See Section 13 for disposal information.                                                                                                                                                            |                    |
| <b>7 Handling and storage</b><br><b>Handling</b><br><b>Precautions for safe handling</b><br>Handle under dry protective gas.<br>Keep container tightly sealed.<br>Store in cool, dry place in tightly closed containers.<br>Ensure good ventilation at the workplace.<br>Open and handle container with care.<br><b>Information about protection against explosions and fires:</b> Keep ignition sources away.<br><b>Conditions for safe storage, including any incompatibilities</b><br><b>Storage</b><br><b>Requirements to be met by storerooms and receptacles:</b> No special requirements.<br><b>Information about storage in one common storage facility:</b><br>Store away from oxidizing agents.<br>Store away from air.<br><b>Further information about storage conditions:</b><br>Store under dry inert gas.<br>This product is air sensitive.<br>Keep container tightly sealed.<br>Store in cool, dry conditions in well sealed containers.<br><b>Specific end use(s)</b> No further relevant information available.                                                                                        |                    |
| <b>8 Exposure controls/personal protection</b><br><b>Additional information about design of technical systems:</b><br>Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.<br><b>Control parameters</b><br><b>Components with limit values that require monitoring at the workplace:</b> Not required.<br><b>Additional information:</b> No data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | (Contd. on page 3) |

Product name: 4-Fluorothiophenol, water <7%

(Contd. of page 2)

**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.  
**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: Unpleasant  
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition

Melting point/Melting range: Not determined  
Boiling point/Boiling range: 170-172 °C (338-342 °F)  
Sublimation temperature / start: Not determined

Flash point: 57 °C (135 °F)  
Flammability (solid, gaseous): Not determined.  
Ignition temperature: Not determined  
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 at 25 °C (77 °F): 2 hPa (2 mm Hg)  
Density at 20 °C (68 °F): 1,203 g/cm³ (10.039 lbs/gal)  
Relative density: Not determined.  
Vapor density: Not determined.  
Evaporation rate: Not determined.  
Solubility in / Miscibility with  
Water: Not miscible or difficult to mix  
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  
Air  
**Hazardous decomposition products:**  
Carbon monoxide and carbon dioxide  
Hydrogen fluoride  
Sulfur oxides (SOx)  
Hydrogen sulfide

11 Toxicological information

Information on toxicological effects

Acute toxicity:

Fatal in contact with skin.  
Fatal if swallowed.  
Toxic if inhaled.  
Danger through skin absorption.

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

**Skin irritation or corrosion:** Causes skin irritation.

**Eye irritation or corrosion:** Causes serious eye irritation.

**Sensitization:** May cause an allergic skin reaction.

**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:** May cause respiratory irritation.

**Aspiration hazard:** No effects known.

**Subacute to chronic toxicity:**

Thiols/mercaptans may be skin, eye and respiratory irritants. Inhalation may cause central nervous system effects. Often the strong penetrating odor acts to minimize inhalation exposure.

(Contd. on page 4)  
USA

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| <b>Product name: 4-Fluorothiophenol, water &lt;7%</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                  |
| <b>Additional toxicological information:</b> To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                  |
| <b>12 Ecological information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                  |
| <p><b>Toxicity</b><br/><b>Aquatic toxicity:</b> No further relevant information available.<br/><b>Persistence and degradability</b> No further relevant information available.<br/><b>Bioaccumulative potential</b> No further relevant information available.<br/><b>Mobility in soil</b> No further relevant information available.<br/><b>Ecotoxicological effects:</b><br/><b>Remark:</b> Very toxic for aquatic organisms<br/><b>Additional ecological information:</b><br/><b>General notes:</b><br/>Do not allow material to be released to the environment without proper governmental permits.<br/>Do not allow product to reach ground water, water course or sewage system, even in small quantities.<br/>Danger to drinking water if even extremely small quantities leak into the ground.<br/>Also poisonous for fish and plankton in water bodies.<br/>May cause long lasting harmful effects to aquatic life.<br/>Avoid transfer into the environment.<br/>Very toxic for aquatic organisms<br/><b>Results of PBT and vPvB assessment</b><br/><b>PBT:</b> Not applicable.<br/><b>vPvB:</b> Not applicable.<br/><b>Other adverse effects</b> No further relevant information available.</p> |                                                                                                                                                                                                                                  |
| <b>13 Disposal considerations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                  |
| <p><b>Waste treatment methods</b><br/><b>Recommendation</b> Consult state, local or national regulations to ensure proper disposal.<br/><b>Uncleaned packagings:</b><br/><b>Recommendation:</b> Disposal must be made according to official regulations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                  |
| <b>14 Transport information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                  |
| <b>UN-Number</b><br><b>DOT, IMDG, IATA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | UN3071                                                                                                                                                                                                                           |
| <b>UN proper shipping name</b><br><b>DOT</b><br><b>IMDG</b><br><b>IATA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Mercaptans, liquid, toxic, flammable, n.o.s. (4-Fluorothiophenol)<br>MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. (4-Fluorothiophenol),<br>MARINE POLLUTANT<br>MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. (4-Fluorothiophenol) |
| <b>Transport hazard class(es)</b><br><b>DOT</b><br><br><b>Class</b><br><b>Label</b><br><b>Class</b><br><b>Label</b><br><b>IMDG</b><br><br><b>Class</b><br><b>Label</b><br><b>IATA</b><br><br><b>Class</b><br><b>Label</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 6.1 Toxic substances.<br>6.1+3<br>6.1 (TF1) Toxic substances<br>6.1+3<br><br>6.1 Toxic substances.<br>6.1+3<br><br>6.1 Toxic substances.<br>6.1+3                                                                                |
| <b>Packing group</b><br><b>DOT, IMDG, IATA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | II                                                                                                                                                                                                                               |
| <b>Environmental hazards:</b><br><b>Marine pollutant (IMDG):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Environmentally hazardous substance, liquid; Marine Pollutant<br>Symbol (fish and tree)                                                                                                                                          |
| <b>Special precautions for user</b><br><b>EMS Number:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Warning: Toxic substances<br>F-E,S-D                                                                                                                                                                                             |
| <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b> Not applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                  |
| <b>Transport/Additional information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                  |
| <b>DOT</b><br><b>Marine Pollutant (DOT):</b><br><b>Remarks:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No<br>Special marking with the symbol (fish and tree).                                                                                                                                                                           |
| <b>UN "Model Regulation":</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | UN3071, Mercaptans, liquid, toxic, flammable, n.o.s. (4-Fluorothiophenol), 6.1 (3), II                                                                                                                                           |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>15 Regulatory information</b>                                                                                                                                                                                           |  |
| <p><b>Safety, health and environmental regulations/legislation specific for the substance or mixture</b><br/><b>GHS label elements</b> The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)</p> |  |
| (Contd. on page 5)<br>USA                                                                                                                                                                                                  |  |

**Product name: 4-Fluorothiophenol, water <7%**

(Contd. of page 4)

**Hazard pictograms**



GHS02 GHS06

**Signal word** *Danger*

**Hazard statements**

H226 *Flammable liquid and vapour.*  
H300+H310 *Fatal if swallowed or in contact with skin.*  
H331 *Toxic if inhaled.*  
H315 *Causes skin irritation.*  
H319 *Causes serious eye irritation.*  
H317 *May cause an allergic skin reaction.*  
H335 *May cause respiratory irritation.*

**Precautionary statements**

P280 *Wear protective gloves / protective clothing.*  
P262 *Do not get in eyes, on skin, or on clothing.*  
P273 *Avoid release to the environment.*  
P305+P351+P338 *IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.*  
P309+P311 *IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.*  
P501 *Dispose of contents/container in accordance with local/regional/national/international regulations.*

**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** 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.

**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)

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)