1 Identification

Product identifier

Product name: **Tetra-n-butylammonium fluoride, 1M solution in THF**

Stock number: A10588, L00763

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
- GHS08 Health hazard
- GHS05 Corrosion
- GHS07 Skin Corr. 1B

Hazard determinating components of labeling:

- Tetra-n-butylammonium fluoride
- Tetrahydrofuran

Hazard statements

- H225 Highly flammable liquid and vapor.
- H302 Harmful if swallowed.
- H314 Causes severe skin burns and eye damage.
- H351 Suspected of causing cancer.
- H335 May cause respiratory 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.
- 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

- B2 - Flammable liquid
- D2B - Toxic material causing other toxic effects
- E - Corrosive material

Classification system

HMIS ratings (scale 0-4)

- Health (acute effects) = 3
- Flammability = 3
- Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
Product name: Tetra-n-butylammonium fluoride, 1M solution in THF

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures

**Dangerous components:**

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Chemical name</th>
<th>Hazard Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>109-99-9</td>
<td>Tetrahydrofuran</td>
<td>Flamm., Liq. 2, H225; Carc. 2, H351; Eye Irrit. 2, H319; STOT SE 3, H335</td>
<td>74.0%</td>
</tr>
<tr>
<td>429-41-4</td>
<td>Tetra-n-butylammonium fluoride</td>
<td>Acute Tox. 3, H301; Skin Corr. 1B, H314; Eye Dam. 1, H318</td>
<td>26.0%</td>
</tr>
</tbody>
</table>

Additional information

Stabilized with:

BHT (CAS# 128-37-0)

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: 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)
- Nitrogen oxides (NOx)

Advice for firefighters:


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:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Use neutralizing agent.

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:


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. Do not distill to dryness. Explosive peroxides may form. Handle container cautiously.

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 strong bases. Store away from water/moisture. Store away from oxidizing agents.

Further information about storage conditions:

Store under dry inert gas. This product is hygroscopic. Store in cool, dry conditions in well sealed containers.

Protect from humidity and water. Avoid contact with air/oxygen (formation of peroxide).

Check container pressure periodically to prevent explosive peroxides.

(Contd. of page 3)
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:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Long-term value (mg/m³)</th>
<th>Short-term value (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>109-99-9 Tetrahydrofuran (74.0%)</td>
<td>590</td>
<td>200 ppm</td>
</tr>
<tr>
<td>REL (USA)</td>
<td>735</td>
<td>250 ppm</td>
</tr>
<tr>
<td>TLV (USA)</td>
<td>590</td>
<td>200 ppm</td>
</tr>
<tr>
<td>EL (Canada)</td>
<td>100 ppm</td>
<td></td>
</tr>
<tr>
<td>EV (Canada)</td>
<td>100 ppm</td>
<td></td>
</tr>
</tbody>
</table>

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.

Recommended filter device for short term use:
Use a respirator with organic vapor/acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).

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.

Material of gloves: Butyl rubber, BR

Penetration time of glove material (in minutes)
Not determined

Glove thickness: 0.3 mm

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: Pale yellow to pale brown

Odor: Not determined
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: -17 °C (1 °F) (THF)
Flammability (solid, gaseous): Not determined
Ignition temperature: 321 °C (610 °F)
Decomposition temperature: Not determined

Auto igniting: Product is not selfigniting.

Danger of explosion: May form explosive peroxides.
Do not distill to dryness.

Explosion limits:
Lower: 2.0 Vol %
Upper: 11.8 Vol %

Vapor pressure at 20 °C (68 °F): 200 hPa (150 mm Hg)
Density at 20 °C (68 °F): 0.903 g/cm³ (7.536 lbs/gal)
Relative density: Not determined
Vapor density: Not determined
Evaporation rate: Not determined
Solubility in / Miscibility with Water: Not determined
Partition coefficient (n-octanol/water): Not determined
Product name: Tetra-n-butylammonium fluoride, 1M solution in THF

Viscosity:
  dynamic: Not determined.
  kinematic: Not determined.

Solvent content:
  Organic solvents: 74.0 %
  Solids content: 26.0 %
  Other information: No further relevant information available.

10 Stability and reactivity

Reactivity: May form explosive peroxides.
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 strong oxidizing agents
May form explosive peroxides.
Conditions to avoid: No further relevant information available.
Incompatible materials:
  Water/moisture
  Oxidizing agents
  Bases
Hazardous decomposition products:
  Carbon monoxide and carbon dioxide
  Nitrogen oxides
  Hydrogen fluoride

11 Toxicological information

Information on toxicological effects
Acute toxicity:
  Harmful if swallowed.
  Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
  The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.
LD/LC50 values that are relevant for classification:
  109-99-9 Tetrahydrofuran
    Oral LD50: 1650 mg/kg (rat)
    Inhalative LC50/2H: 72000 mg/m3/2H (rat)
Skin irritation or corrosion: Causes severe skin burns.
Eye irritation or corrosion: Causes serious eye damage.
Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.
Carcinogenicity:
  Suspected of causing cancer.
  EPA-S: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential.
  ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans.
  Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.
  The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: May cause respiratory irritation.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information:
  To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
  The product shows the following dangers according to internally approved calculation methods for preparations:
    Harmful
    Corrosive
    Irritant

12 Ecological information

Toxicity: No further relevant information available.
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: Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings: Disposal must be made according to official regulations.

14 Transport information

UN-Number
  DOT, IMDG, IATA: UN2924
**Safety Data Sheet**

**Product name:** Tetra-n-butylammonium fluoride, 1M solution in THF

### UN proper shipping name

**DOT**
Flammable liquids, corrosive, n.o.s. (Tetrahydrofuran, Tetra-n-butylammonium fluoride)

**IMDG, IATA**
FLAMMABLE LIQUID, CORROSIVE, N.O.S. (TETRAHYDROFURAN, Tetra-n-butylammonium fluoride)

### Transport hazard class(es)

#### DOT

<table>
<thead>
<tr>
<th>Class</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3+8</td>
</tr>
<tr>
<td>3 (FC) Flammable liquids</td>
<td></td>
</tr>
</tbody>
</table>

#### IMDG, IATA

<table>
<thead>
<tr>
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<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3+8</td>
</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>

### Packing group

<table>
<thead>
<tr>
<th>DOT, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
</tr>
</tbody>
</table>

### Environmental hazards:

- **Marine pollutant (IMDG):** No

### Special precautions for user

**Warning:** Flammable liquids

### 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":** UN2924, Flammable liquids, corrosive, n.o.s. (Tetrahydrofuran, Tetra-n-butylammonium fluoride), 3 (8), II

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### 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)

**Hazard pictograms**

- GHS02
- GHS05
- GHS07
- GHS08

**Signal word** Danger

**Hazard-determining components of labeling:**
- Tetra-n-butylammonium fluoride
- Tetrahydrofuran

**Hazard statements**

- H225 Highly flammable liquid and vapor.
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- 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.

**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 Domestic Substances List (DSL).

**SARA Section 313 (specific toxic chemical listings)**

| 109-99-9 | Tetrahydrofuran | 74.0% |

**California Proposition 65**

- Prop 65 - Chemicals known to cause cancer
  None of the ingredients are listed.

- Prop 65 - Developmental toxicity
  None of the ingredients are listed.

- Prop 65 - Developmental toxicity, female
  None of the ingredients are listed.

- Prop 65 - Developmental toxicity, male
  None of the ingredients are listed.

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

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.**

None of the ingredients are 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.**

None of the ingredients is listed.
Product name: Tetra-n-butylammonium fluoride, 1M solution in THF

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 11/24/2015 / -

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)
ICAO: International Civil Aviation Organization
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
DOO: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)

USA