1 Identification of substance:
Product details:
Product name: Tetraethylammonium tetrafluoroborate
Stock number:
A10211
L06736
Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com
Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:
Chemical characterization:
Description: (CAS#)
Tetraethylammonium tetrafluoroborate (CAS# 429-06-1): 100%
Identification number(s):
EINECS Number: 207-055-1

3 Hazards identification
Hazard description:
Xn Harmful
Information pertaining to particular dangers for man and environment
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R 36/37/38 Irritating to eyes, respiratory system and skin.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)
<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Health (acute effects) = 1
Flammability = 1
Reactivity = 1
GHS label elements

3.1/3 - Toxic if inhaled.
3.1/4 - Harmful if swallowed.
3.1/4 - Harmful in contact with skin.
3.2/2 - Causes skin irritation.
3.3/2A - Causes serious eye irritation.
3.8/3 - May cause respiratory irritation.
Prevention:
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
Response:
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a POISON CENTER or doctor/physician.
Call a POISON CENTER or doctor/physician if you feel unwell.
Specific treatment (see label).
**4 First aid measures**

**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. Rub in calcium gluconate solution or calcium gluconate gel immediately.

**After eye contact**
Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing**
Seek immediate medical advice.

**5 Fire fighting measures**

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

**Special hazards caused by the material, its products of combustion or resulting gases:**
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx) Hydrogen fluoride (HF)

**Protective equipment:**
Wear self-contained respirator.
Wear fully protective impervious suit.

**6 Accidental release measures**

**Person-related safety precautions:**
Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation

**Measures for environmental protection:**
Do not allow material to be released to the environment without proper governmental permits.

**Measures for cleaning/collecting:**
Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

**Additional information:**
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**
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.

**Information about protection against explosions and fires:**
Keep ignition sources away.

**Storage**
Requirements to be met by storerooms and receptacles:
No special requirements.

**Information about storage in one common storage facility:**
Store away from water/moisture.
Store away from oxidizing agents.

**Further information about storage conditions:**
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
8 Exposure controls and 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.

Components with limit values that require monitoring at the workplace:

Fluorides (as F) mg/m³
ACGIH TLV 2.5
Austria MAK 2.5
Belgium TWA 2.5
Finland TWA 2.5
France TWA 2.5
Germany MAK 2.5
Hungary TWA 1; 2-STEL
Netherlands MAC-K 3.5
Norway TWA 0.6
Poland TWA 1; 3-STEL
Sweden NGV 2
Switzerland MAK-W 1.5; 3-KZG-W
United Kingdom TWA 2.5
Russia TWA 2
Denmark TWA 2.5
USA PEL 2.5

Additional information: No data

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.

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

Protection of hands: Impervious gloves

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties:

| Form: | Crystalline powder |
| Color: | White |
| Odor: | Not determined |

Change in condition

| Melting point/Melting range: | Not determined |
| Boiling point/Boiling range: | Not determined |
| Sublimation temperature / start: | Not determined |

Flash point: Not applicable

Ignition temperature: Not determined

Decomposition temperature: Not determined

Danger of explosion: Product does not present an explosion hazard.

Explosion limits:

| Lower: | Not determined |
| Upper: | Not determined |

Vapor pressure: Not determined

Density: Not determined

10 Stability and reactivity

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

Acute toxicity:
Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Subacute to chronic toxicity:
Fluorides may cause salivation, nausea, vomiting, diarrhea and abdominal pain, followed by weakness, tremors, shallow respiration, convulsions and coma. May cause brain and kidney damage. Chronic fluoride poisoning can cause severe bone changes, loss of weight, anorexia, anemia and dental defects.
Subacute to chronic toxicity:
Boron affects the central nervous system. Boron poisoning causes depression of the circulation, persistent vomiting and diarrhea, followed by profound shock and coma. The temperature may become subnormal and a scarletina form rash may cover the entire body.
Additional toxicological information:
Danger through skin absorption.
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
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

DOT regulations:

<table>
<thead>
<tr>
<th>Hazard class</th>
<th>Identification number</th>
<th>Packing group</th>
<th>Proper shipping name (technical name)</th>
<th>Label</th>
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</thead>
<tbody>
<tr>
<td>6.1</td>
<td>UN2811</td>
<td>III</td>
<td>TOXIC SOLID, ORGANIC, N.O.S. (Tetraethylammonium tetrafluoroborate)</td>
<td>6.1</td>
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</table>

Land transport ADR/RID (cross-border)

<table>
<thead>
<tr>
<th>ADR/RID class</th>
<th>Danger code (Kemler)</th>
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</thead>
<tbody>
<tr>
<td>6.1 (T2) Toxic substances</td>
<td>60</td>
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</table>
Material Safety Data Sheet
acc. to OSHA and ANSI

Printing date 06/11/2009 Reviewed on 06/11/2009

Product name: Tetraethylammonium tetrafluoroborate

(Contd. of page 4)

<table>
<thead>
<tr>
<th>UN-Number:</th>
<th>2811</th>
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<tbody>
<tr>
<td>Packaging group:</td>
<td>III</td>
</tr>
<tr>
<td>Description of goods:</td>
<td>2811 TOXIC SOLID, ORGANIC, N.O.S. (Tetraethylammonium tetrafluoroborate)</td>
</tr>
</tbody>
</table>

Maritime transport IMDG:

IMDG Class: 6.1
UN Number: 2811
Label 6.1
Packaging group: III
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (Tetraethylammonium tetrafluoroborate)

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 6.1
UN/ID Number: 2811
Label 6.1
Packaging group: III
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (Tetraethylammonium tetrafluoroborate)

UN "Model Regulation": UN2811, TOXIC SOLID, ORGANIC, N.O.S., 6.1, III

15 Regulations

Product related hazard informations:

Hazard symbols:
Xn Harmful

Risk phrases:
20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
36/37/38 Irritating to eyes, respiratory system and skin.

Safety phrases:
9 Keep container in a well-ventilated place.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37 Wear suitable protective clothing and gloves.
60 This material and its container must be disposed of as hazardous waste.

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.

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

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 MSDS: Health, Safety and Environmental Department.
Contact: Zachariah Holt

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
Product name: Tetraethylammonium tetrafluoroborate

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)
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)

USA