1 Identification

Product identifier

Product name: tert-Butyl methyl ether

Stock number: L14030

CAS Number: 1634-04-4

EC number: 216-653-1

Index number: 603-181-00-X

Relevant identified uses of the substance or mixture and uses advised against.

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number: During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS02 Flame

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

GHS07

Skin Irrit. 2 H315 Causes skin irritation.

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 GHS07

Signal word Danger

Hazard statements

H225 Highly flammable liquid and vapor.

H315 Causes skin irritation.

Precautionary statements

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P362 Take off contaminated clothing.

P403+P235 Store in a well-ventilated place. Keep cool.

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

Classification system

HMIS ratings (scale 0-4)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Health (acute effects)</td>
</tr>
<tr>
<td>3</td>
<td>Flammability</td>
</tr>
<tr>
<td>1</td>
<td>Physical Hazard</td>
</tr>
</tbody>
</table>

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable. vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

1634-04-4 tert-Butyl methyl ether

Identification number(s):

EC number: 216-653-1

Index number: 603-181-00-X

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

4.0.1 Description of 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.

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: No further relevant information available.
Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

5.0.1 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

Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

6.0.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

Environmental precautions:
Do not allow product to reach sewage system or any water course.

Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Ensure adequate ventilation.

Prevention of secondary hazards:
Keep away from ignition sources.

Reference to other sections
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

7.0.1 Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.

Information about 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:
Store in a cool location.

Information about storage in one common storage facility:
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s)
No further relevant information available.

8 Exposure controls/personal protection

8.0.1 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.

8.0.2 Control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value (USA)</th>
<th>Limit Value (Canada)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1034-04-4 tert-Butyl methyl ether (100.0%)</td>
<td>TLV (USA) Long-term value: 180 mg/m³, 50 ppm</td>
<td>EL (Canada) Long-term value: 50 ppm</td>
</tr>
<tr>
<td></td>
<td>EV (Canada) Long-term value: 40 ppm</td>
<td></td>
</tr>
</tbody>
</table>

8.0.3 Additional information:
No data

8.0.4 Exposure controls

8.0.5 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.

Breathing equipment:
Use suitable respirator when high concentrations are present.
Use suitable respiratory protective device in case of insufficient ventilation.

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
9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:
Form: Liquid
Color: Colorless
Odor: Mild
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: -109 °C (-164 °F)
Boiling point/Boiling range: 55-56 °C (131-133 °F)
Sublimation temperature / start: Not determined

Flash point: -25 °C (-13 °F)
Flammability (solid, gaseous): Not determined.
Ignition temperature: 192 °C (378 °F)
Decomposition temperature: Not determined
Auto igniting: Not determined.

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

Explosion limits:
Lower: 1.6 Vol %
Upper: 15.1 Vol %

Vapor pressure at 20 °C (68 °F): 319 hPa (239 mm Hg)
Density at 20 °C (68 °F): 0.74 g/cm³ (6.175 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.
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 Reacts with strong oxidizing agents
Conditions to avoid No further relevant information available.

Incompatible materials: Oxidizing agents

Hazardous decomposition products: Carbon monoxide and carbon dioxide

11 Toxicological information

Information on toxicological effects

Acute toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

LD50/LC50 values that are relevant for classification:
Oral [LD50] 4000 mg/kg (rat)
Skin irritation or corrosion: Causes skin irritation.
Eye irritation or corrosion: May cause irritation
Sensitization: No sensitizing effects known.

Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.

Carcinogenicity:
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.

IARC-3: Not classifiable as to carcinogenicity to humans.

Reproductive toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for this substance.

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) 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.

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 undiluted product or large quantities to reach ground water, water course or sewage system.

Avoid transfer into the environment.

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

Other adverse effects: No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.
14 Transport information

**UN-Number**
DOT, IMDG, IATA: UN2350

**UN proper shipping name**
DOT: Butyl methyl ether
IMDG, IATA: BUTYL METHYL ETHER

**Transport hazard class(es)**

**DOT**

<table>
<thead>
<tr>
<th>Class</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>Flammable liquids.</td>
</tr>
</tbody>
</table>

**IMDG, IATA**

<table>
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</tr>
</thead>
<tbody>
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<td>3</td>
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<td>Flammable liquids.</td>
</tr>
</tbody>
</table>

**Packing group**

DOT, IMDG, IATA: II

**Environmental hazards:**
Not applicable.

**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"**

UN2350, Butyl methyl ether, 3, II

15 Regulatory information

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

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

**Hazard pictograms**

GHS02 GHS07

**Signal word**
Danger

**Hazard statements**

H225 Highly flammable liquid and vapor.
H315 Causes skin irritation.

**Precautionary statements**

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P303+P351+P338 In case of contact with eyes: rinse immediately with plenty of water or physiologica

P301+P353+P338 In case of contact with skin: Take off contaminated clothing.
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)**

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:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMDG</td>
<td>International Maritime Code for Dangerous Goods</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (division of the American Chemical Society)</td>
</tr>
<tr>
<td>HMIS</td>
<td>Hazardous Materials Identification System (USA)</td>
</tr>
<tr>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System (Canada)</td>
</tr>
<tr>
<td>LC₅₀</td>
<td>Lethal concentration, 50 percent</td>
</tr>
<tr>
<td>LD₅₀</td>
<td>Lethal dose, 50 percent</td>
</tr>
<tr>
<td>vPvB</td>
<td>Very Persistent and very Bioaccumulative</td>
</tr>
<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists (USA)</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration (USA)</td>
</tr>
<tr>
<td>NTP</td>
<td>National Toxicology Program (USA)</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency (USA)</td>
</tr>
</tbody>
</table>