SAFETY DATA SHEET

1. Identification

Product Name: Isopropyl ether
Cat No.: AC180680000; AC180680010; AC180680025; AC180680250
Synonyms: 2-Isopropoxypropane; DIPE; Diisopropyl ether
Recommended Use: Laboratory chemicals.
Uses advised against: No Information available

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids
Specific target organ toxicity (single exposure)
Target Organs - Central nervous system (CNS).

Category 2
Category 3

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
May cause drowsiness or dizziness
Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
Keep cool

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell

Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower

Fire
In case of fire: Use CO2, dry chemical, or foam for extinction

Storage
Store in a well-ventilated place. Keep container tightly closed
Store locked up

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
May form explosive peroxides
Repeated exposure may cause skin dryness or cracking

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>108-20-3</td>
<td>&gt; 99</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>128-37-0</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

4. First-aid measures

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention if symptoms occur.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Get medical attention if symptoms occur.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Get medical attention if symptoms occur.

Ingestion
Do not induce vomiting. Obtain medical attention.

Most important symptoms/effects
Breathing difficulties. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Notes to Physician
Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media
CO₂, dry chemical, dry sand, alcohol-resistant foam. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media
Water may be ineffective

Flash Point
-29 °C / -20.2 °F
Method - No information available

Autoignition Temperature
405 °C / 761 °F

Explosion Limits
Upper 21 vol %
Lower 1.1 vol %

Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Flammable. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated. May form explosive peroxides. Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Carbon monoxide (CO) Carbon dioxide (CO₂) peroxides

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6. Accidental release measures

Personal Precautions
Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing.

Environmental Precautions
Avoid release to the environment. See Section 12 for additional ecological information.

Methods for Containment and Clean Up
Remove all sources of ignition. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Take precautionary measures against static discharges.

7. Handling and storage

Handling
Wear personal protective equipment. Ensure adequate ventilation. Use spark-proof tools and explosion-proof equipment. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Do not ingest. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. If peroxide formation is suspected, do not open or move container.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from direct sunlight. Keep away from heat and sources of ignition. Keep under nitrogen. Flammables area. May form explosive peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals.

8. Exposure controls / personal protection

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>TWA: 250 ppm&lt;br&gt;STEL: 310 ppm</td>
<td>(Vacated) TWA: 500 ppm&lt;br&gt;(Vacated) TWA: 2100 mg/m³&lt;br&gt;TWA: 500 ppm&lt;br&gt;TWA: 2100 mg/m³</td>
<td>IDLH: 1400 ppm&lt;br&gt;TWA: 500 ppm&lt;br&gt;TWA: 2100 mg/m³</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>TWA: 2 mg/m³</td>
<td>(Vacated) TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Quebec</th>
<th>Mexico OEL (TWA)</th>
<th>Ontario TWAEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>TWA: 250 ppm&lt;br&gt;STEL: 310 ppm</td>
<td>TWA: 250 ppm&lt;br&gt;TWA: 1050 mg/m³&lt;br&gt;STEL: 310 ppm</td>
<td>TWA: 250 ppm&lt;br&gt;STEL: 310 ppm</td>
</tr>
</tbody>
</table>
9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Strong Ether</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>-85.5 °C / -121.9 °F</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>68 °C / 154.4 °F @ 760 mmHg</td>
</tr>
<tr>
<td>Flash Point</td>
<td>-29 °C / -20.2 °F</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability (solid,gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability or explosive limits</td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>21 vol %</td>
</tr>
<tr>
<td>Lower</td>
<td>1.1 vol %</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>180 mbar @ 20 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>1.42</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.720</td>
</tr>
<tr>
<td>Solubility</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient; n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>405 °C / 761 °F</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>0.38 mPa s at 25 °C</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C6 H14 O</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>102.18</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.367 - 1.369 @ 20 °C</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

<table>
<thead>
<tr>
<th>Reactive Hazard</th>
<th>Yes</th>
</tr>
</thead>
</table>
Conditions to Avoid

Incompatible Materials
Acids, Strong oxidizing agents, Amines, Aldehydes

Hazardous Decomposition Products
Carbon monoxide (CO), Carbon dioxide (CO₂), peroxides

Hazardous Polymerization
Hazardous polymerization does not occur.

Hazardous Reactions
May form explosive peroxides.

11. Toxicological information

Acute Toxicity

Product Information
Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>LD50 = 4700 mg/kg (Rat)</td>
<td>LD50 = 20 mL/kg (Rabbit)</td>
<td>Not listed</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>&gt;2000 mg/kg (Rat)</td>
<td>&gt;2000 mg/kg (Rat)</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Toxicologically Synergistic Products
No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation
No information available

Sensitization
No information available

Carcinogenicity
The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>108-20-3</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>128-37-0</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Mutagenic Effects
No information available

Reproductive Effects
No information available.

Developmental Effects
No information available.

Teratogenicity
No information available.

STOT - single exposure
Central nervous system (CNS)

STOT - repeated exposure
None known

Aspiration hazard
No information available

Symptoms / effects, both acute and delayed
Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information
No information available

Other Adverse Effects
The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>Not listed</td>
<td>LC50: = 7000 mg/L, 96h static (Lepomis macrochirus)</td>
<td>EC50 = 500 mg/L, 5 min</td>
<td>EC50: = 190 mg/L, 48h (Daphnia magna)</td>
</tr>
</tbody>
</table>
Isopropyl ether  

**13. Disposal considerations**

**Waste Disposal Methods**
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

**14. Transport information**

**DOT**
- UN-No: UN1159
- Proper Shipping Name: DIISOPROPYL ETHER
- Hazard Class: 3
- Packing Group: II

**TDG**
- UN-No: UN1159
- Proper Shipping Name: DIISOPROPYL ETHER
- Hazard Class: 3
- Packing Group: II

**IATA**
- UN-No: UN1159
- Proper Shipping Name: DIISOPROPYL ETHER
- Hazard Class: 3
- Packing Group: II

**IMDG/IMO**
- UN-No: UN1159
- Proper Shipping Name: DIISOPROPYL ETHER
- Hazard Class: 3
- Packing Group: II

**15. Regulatory information**

**International Inventories**

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AIACS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>203-560-6</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>204-881-4</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Legend:**
- X - Listed
- E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
- F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
- N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
- P - Indicates a commenced PMN substance
- R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
- S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
- T - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base

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LC50: = 91.7 mg/L, 96h flow-through (Pimephales promelas)

2,6-Di-tert-butyl-p-cresol

EC50 = 0.758 mg/L 96h
EC50 = 0.199 mg/L 96h
EC50 = 7.82 mg/L 5 min
EC50 = 8.57 mg/L 15 min
EC50 = 8.98 mg/L 30 min
EC50 >0.31 mg/L 48h

Persistenec and Degradability
Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation
No information available.

Mobility
Will likely be mobile in the environment due to its volatility.

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>1.52</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>4.17</td>
</tr>
</tbody>
</table>
Production and Site Reports (40 CFR 710(B)).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b)  Not applicable
SARA 313  Not applicable
SARA 311/312 Hazard Categories
Acute Health Hazard  Yes
Chronic Health Hazard  No
Fire Hazard  Yes
Sudden Release of Pressure Hazard  No
Reactive Hazard  Yes

CWA (Clean Water Act)  Not applicable
Clean Air Act  Not applicable
OSHA Occupational Safety and Health Administration  Not applicable
CERCLA  Not applicable
California Proposition 65  This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl ether</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

U.S. Department of Transportation

Reportable Quantity (RQ):  N
DOT Marine Pollutant  N
DOT Severe Marine Pollutant  N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade  No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class  B2 Flammable liquid
                   D2B Toxic materials
16. Other information

Prepared By  Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date  23-Apr-2014
Revision Date  16-Mar-2016
Print Date  16-Mar-2016
Revision Summary  This document has been updated to comply with the US OSHA HazCom 2012 Standard
replacing the current legislation under 29 CFR 1910.1200 to align with the Globally
Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the
date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage,
transportation, disposal and release and is not to be considered a warranty or quality specification. The information
relates only to the specific material designated and may not be valid for such material used in combination with any other
materials or in any process, unless specified in the text

End of SDS