SAFETY DATA SHEET

P-TERT-BUTYLPHENOL

SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Trade name P-TERT-BUTYLPHENOL
Synonyms para-Tert-Butylphenol; 4-t-Butylphenol
Use Agricultural, Flavors and Fragrances, Oilfield
Company Sasol Chemicals (USA) LLC
(an affiliate of Sasol Chemicals North America LLC)
Address 12120 Wickchester Lane   Houston TX 77079
Telephone CHEMTREC North America Transportation Emergency (24-hr) (800) 424-9300
CHEMTREC World Wide (703) 527-3887
Other Emergencies (24-hr) (337) 494-5142
MSDS and Product Information (8:00am-4:30pm CST) (281) 588-3491
Health and Safety Information (7:30am-4:00pm CST) (281) 588-3492
E-mail address SasolElectronicSDS@us.sasol.com

SECTION 2 HAZARDS IDENTIFICATION

GHS Hazards
Serious eye damage Category 1
Skin irritation Category 2
Reproductive toxicity Category 2
Chronic aquatic toxicity Category 1

LABEL ELEMENTS

Hazard symbols

Signal word Danger

Hazard statements H318 Causes serious eye damage.
H315 Causes skin irritation.
H361f Suspected of damaging fertility.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P-TERT-BUTYLPHENOL

P273 Avoid release to the environment.

Response
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P391 Collect spillage.

Storage
P405 Store locked up.

Disposal
P501 Dispose of contents/container to an approved waste disposal plant.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
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<tbody>
<tr>
<td>Phenol, 4-(1,1-dimethylethyl)-</td>
<td>98-54-4</td>
<td>100</td>
</tr>
</tbody>
</table>

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

SECTION 4 FIRST AID MEASURES

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If skin irritation persists, call a physician.

Inhalation Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. In case of shortness of breath, give oxygen. Call a physician immediately.

Ingestion Do not induce vomiting without medical advice. Call a physician immediately. Never give anything by mouth to an unconscious person.

SECTION 5 FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES
Fire/explosion NFPA Class IIIB combustible liquid.

Suitable extinguishing media Water spray or fog, foam, dry chemical, CO2

Protective equipment and precautions for firefighters Wear self-contained breathing apparatus and protective suit.
Further information: Cool closed containers exposed to fire with water spray. Container may rupture on heating. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Methods and materials for containment and cleaning up

- Use personal protective equipment.
- Remove all sources of ignition.
- Avoid dust formation.
- Ensure adequate ventilation.
- Use mechanical handling equipment.
- Sweep up and shovel into suitable containers for disposal.
- Avoid subsoil penetration.
- Do not flush into surface water or sanitary sewer system.

SECTION 7 HANDLING AND STORAGE

Safe handling advice

- Avoid dust formation. During processing, dust may form explosive mixture in air. Provide appropriate exhaust ventilation at places where dust is formed. In case of inadequate ventilation wear respiratory protection. Keep away from direct sunlight.

Storage/Transport temperature

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 35 °C</td>
<td>&lt;= 95 °F</td>
</tr>
</tbody>
</table>

Load/Unload temperature

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>120 °C</td>
<td>248 °F</td>
</tr>
</tbody>
</table>

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES

- Ensure adequate ventilation, especially in confined areas.

PERSONAL PROTECTIVE EQUIPMENT

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eyes</strong></td>
</tr>
<tr>
<td>Chemical resistant goggles must be worn., Face-shield</td>
</tr>
<tr>
<td><strong>Skin</strong></td>
</tr>
<tr>
<td>Wear suitable protective clothing, gloves and eye/face protection.</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
</tr>
<tr>
<td>Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors.</td>
</tr>
</tbody>
</table>

EXPOSURE GUIDELINES

- Contains no substances with occupational exposure limit values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
</tr>
<tr>
<td>solid;</td>
</tr>
<tr>
<td><strong>Colour</strong></td>
</tr>
<tr>
<td>white</td>
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</table>
### P-TERT-BUTYLPHENOL

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form</strong></td>
<td>Solid, flakes</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>phenol-like</td>
</tr>
<tr>
<td><strong>Odour Threshold</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>ca. 115 °C, 239 °F; ISO 2719;</td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td>Upper explosion limit: not applicable</td>
</tr>
<tr>
<td><strong>Boiling point</strong></td>
<td>237 °C, 459 °F;</td>
</tr>
<tr>
<td><strong>Melting point</strong></td>
<td>ca. 100 °C, 212 °F;</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>not applicable</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
<td>&lt; 0.01 hPa @ 20 °C, 68 °F;</td>
</tr>
<tr>
<td><strong>Vapour density</strong></td>
<td>&gt; 1</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>0.91 g/cm³ Bulk density: 450,000 g/cm³ @ 110 °C, 230 °F;</td>
</tr>
<tr>
<td><strong>Specific gravity</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Water solubility</strong></td>
<td>0.5 g/l @ 20 °C, 68 °F;</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Viscosity, dynamic</strong></td>
<td>not applicable</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Partition coefficient</strong>:</td>
<td>log Pow: 3.29; @ 25 °C, 77 °F; OECD Test Guideline 107;</td>
</tr>
</tbody>
</table>

### SECTION 10 STABILITY AND REACTIVITY

**Reactivity**  Stable under recommended storage conditions.

**Chemical stability**  No decomposition if stored and applied as directed.
SAFETY DATA SHEET

P-TERT-BUTYLPHENOL

Conditions to avoid

Direct heating, dirt, chemical contamination, sunlight, UV or ionising radiation.

Hazardous decomposition products

phenol olefins

Materials to avoid

Acids

Oxidizing agents

Hazardous polymerisation

None known.

SECTION 11 TOXICOLOGICAL INFORMATION

Additional Remarks

The product may be absorbed through the skin. May cause depigmentation (Vitiligo).

Acute dermal toxicity

LD50 rabbit: > 2,000 mg/kg; OECD Test Guideline 402 (literature value)

Acute inhalation toxicity

LC50 rat (4 hours): > 5.6 mg/l; OECD Test Guideline 403 (literature value)

Acute oral toxicity

LD50 rat: > 2,000 mg/kg; OECD Test Guideline 401 (literature value)

Skin corrosion/irritation

(rabbit): OECD Test Guideline 404 irritating

Eye damage/irritation

(rabbit): OECD Test Guideline 405 Causes serious eye damage. (literature value)

Respiratory or skin sensitization

guinea pig: not sensitizing; Maximisation Test OECD Test Guideline 406

Germ cell mutagenicity

Genotoxicity in vitro: Result: In vitro tests did not show mutagenic effects.

Genotoxicity in vivo: Result: In vivo tests did not show mutagenic effects

Assessment Mutagenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity

Reproductive toxicity: rat; Oral; 140-day; OECD Test Guideline 416

NOAEL (parents): 70 mg/kg

NOAEL (F1): 70 mg/kg

NOAEL (F2): 70 mg/kg

Assessment Reproductive toxicity: Suspected of damaging fertility.

Teratogenicity:
P-TERT-BUTYLPHENOL

rat; Oral; OECD Test Guideline 416
NOAEL (teratogen): 70 mg/kg
NOAEL (maternal): 70 mg/kg

Assessment teratogenicity:
Based on available data, the classification criteria are not met.

STOT - single exposure
May cause respiratory irritation.

STOT - repeated exposure
rat; Oral; 140-day; OECD Test Guideline 416
NOAEL: 70 mg/kg
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration toxicity not applicable

Carcinogenicity Assessment carcinogenicity:
Contains no ingredient listed as a carcinogen

SECTION 12 ECOLOGICAL INFORMATION

Aquatic toxicity Very toxic to aquatic life with long lasting effects.

Toxicity to fish LC50 (Oncorhynchus mykiss (rainbow trout)) 96 hours: > 1 - 10 mg/l; static test; OECD Test Guideline 203

Toxicity to aquatic invertebrates EC50 (Daphnia magna (Water flea)) 48 hours: > 1 - 10 mg/l; static test; OECD Test Guideline 202

Toxicity to algae ErC50 (Selenastrum capricornutum (green algae)) 72 hours: > 10 - 100 mg/l; static test

Chronic toxicity to fish NOEC (Pimephales promelas (fathead minnow)) 128 d: > 0.01 - 0.1 mg/l

Chronic toxicity to aquatic invertebrates NOEC (Daphnia magna (Water flea)) 21 d: > 0.1 - 1 mg/l; semi-static test; OECD Test Guideline 211 (literature value)

Toxicity to bacteria EC50 (activated sludge) 3 hours: > 10 - 100 mg/l; Respiration inhibition; OECD Test Guideline 209

Biodegradation Not readily biodegradable.

OECD Test Guideline 301F (28 d): 60 %
(10 day window not reached)

Bioaccumulation Cyprinus carpio (Carp) (56 d, 0.004 mg/l): BCF: 48 - 88; OECD Test Guideline 305C

Cyprinus carpio (Carp) (56 d, 0.04 mg/l): BCF: 20 - 43; OECD Test Guideline 305C
Bioaccumulation is unlikely., Does not accumulate in organisms.
P-TERT-BUTYLPHENOL

Mobility in soil  Adsorption/Soil
Koc: 1286; log Koc: 3.1
low mobility in soils, (literature value)

Other adverse effects  Based on available data, the classification criteria are not met.

SECTION 13  DISPOSAL CONSIDERATIONS

Waste Code  Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures, contamination, and spillage may change the classification.

Disposal methods  Dispose of only in accordance with local, state, and federal regulations. Land disposal of this product is restricted. Do not contaminate any lakes, streams, ponds, groundwater or soil.

Empty containers.  Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, triple-rinsed, properly bunged and promptly returned to a drum reconditioner, or properly disposed.

SECTION 14  TRANSPORT INFORMATION

DOT  UN 3077, Environmentally hazardous substance, solid, n.o.s. (p-tert-butylphenol), 9, III, Marine pollutant

IATA  UN 3077, Environmentally hazardous substance, solid, n.o.s. (p-tert-butylphenol), 9, III EHS-Mark required (IATA and IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

IMDG  UN 3077, Environmentally hazardous substance, solid, n.o.s., (p-tert-butylphenol), 9, III, Marine pollutant
EHS-Mark required (IATA and IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Remarks  no data available

SECTION 15  REGULATORY INFORMATION
P-TERT-BUTYLPHENOL

U.S. FEDERAL REGULATIONS

OSHA Hazards (HCS 1994)
Irritating to eyes, respiratory system and skin.

TSCA Inventory Listing

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol, 4-(1,1-dimethylethyl)-</td>
<td>98-54-4</td>
<td></td>
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</table>

SARA 302 Status

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Classification
"Immediate (acute) health hazard", "Delayed (chronic) health hazard"

SARA 313 Chemical

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

<table>
<thead>
<tr>
<th>Components</th>
<th>Reportable Quantity</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
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</tr>
</tbody>
</table>

INTERNATIONAL REGULATIONS

WHMIS Classification
Class D, Division 2, Subdivision A: Very toxic material
Class D, Division 2, Subdivision B: Toxic material.

European Union
Classification according to Regulation (EU) 1272/2008.

- Serious eye damage, Category 1
- Skin irritation, Category 2
- Reproductive toxicity, Category 2
- Chronic aquatic toxicity, Category 1

Australia. Inventory of Chemical Substances (AICS) Listed

Japan. Inventory of Existing and New Chemical Substances (ENCS) Listed

Japan. Industrial Safety & Health Law (ISHL) Inventory Listed

Canada. Domestic Substances List (DSL) Inventory Listed

Canadian Non-Domestic Substance Listing (NDSL) Not listed

European Inventory of Existing Commercial Chemical Substances (EINECS) Listing Listed
P-TERT-BUTYLPHENOL

Philippines. Inventory of Chemicals / Chemical Substances (PICCS) Listed

Korea. Existing Chemicals Inventory (KECI) Listed

China. Inventory of Existing Chemical Substances (IECSC) Listed

Mexico. National Inventory of Chemical Substances (INSQ) Listed

New Zealand. Inventory of Chemicals (NZIoC) Listed

Switzerland. Inventory of Notified New Substances (CHINV) Listed

Taiwan. National Existing Chemical Inventory (NECI) Listed

Please note: The names and CAS numbers which are used for this product in the stated inventories may deviate from the information which is listed in Section 3.

STATE REGULATIONS

California Prop. 65
Components none

SECTION 16 OTHER INFORMATION

HAZARD RATINGS

<table>
<thead>
<tr>
<th>HMIS®</th>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard/Instability</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>3</td>
<td>1</td>
<td>0</td>
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