SAFETY DATA SHEET

Phenol

Issuing Date: 27-May-2012
Revision Date: 17-May-2014
Version 3

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name
Phenol

UN/ID No
UN1671

Synonyms
Phenol

Molecular Weight
94.11

Recommended use

Manufacturer
Sasol Chemicals (USA) LLC
1914 Haden Road, Houston, TX 77015-6498
Telephone: (713) 428-5400

Emergency telephone

2. HAZARDS IDENTIFICATION

GHS - Classification

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Acute inhalation toxicity - dust/mist</td>
<td>Category 3</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Specific target organ systemic toxicity (repeated exposure)</td>
<td>Category 2</td>
</tr>
<tr>
<td>Acute aquatic toxicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Chronic aquatic toxicity</td>
<td>Category 2</td>
</tr>
</tbody>
</table>

GHS Label elements, including precautionary statements
Signal Word:  DANGER

Hazard statements

• Toxic if swallowed
• Toxic in contact with skin
• Toxic if inhaled
• Causes severe skin burns and eye damage
• Suspected of causing genetic defects
• May cause damage to organs through prolonged or repeated exposure
• Toxic to aquatic life with long lasting effects

Physical hazards

Flammable liquids  Category 4
• Combustible Liquid

Precautionary Statements - EU (§28, 1272/2008)
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ 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
P310 - Immediately call a POISON CENTER or doctor/ physician
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction
P273 - Avoid release to the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>EC-No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>108-95-2</td>
<td>100</td>
<td>Present</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General advice
Immediate medical attention is required.

Main symptoms
Burn. Central nervous system depression. Liver and kidney injuries may occur. Inhalation of vapors in high concentration may cause shortness of breath (lung edema).
Phenol

Eye contact
Immediate medical attention is required. Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area.

Skin contact
Immediate medical attention is required. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Apply PEG/EtOH solution liberally to affected area. Allow to remain 15 to 30 seconds, then wash with water. Continue cycle of water - PEG/EtOH solution for at least 15 minutes. (PEG/EtOH solution consists of 2 parts polyethylene glycol 400 to 1 part ethanol. For external use only). Finish decontamination with thorough washing using soap and water.

Inhalation
Move to fresh air. Call a physician or poison control center immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion
Immediate medical attention is required. Do NOT induce vomiting. Rinse mouth. Ingest immediately about 350 ml (5 ml/kg body weight) of activated charcoal slurry. Note: To prepare activated charcoal slurry, mix thoroughly 50 g of activated charcoal in 400 ml (about 2 cups) water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

Notes to physician
Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. Treat symptomatically.

Protection of first-aiders
Use personal protective equipment. Avoid contact with skin, eyes and clothing.

5. FIRE-FIGHTING MEASURES

Flammable properties
Combustible Liquid.

Suitable Extinguishing Media
Dry chemical, Foam, Water spray, Carbon dioxide (CO2).

Unsuitable Extinguishing Media
Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical
In the event of fire and/or explosion do not breathe fumes. The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.

Protective equipment and precautions for firefighters
Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Evacuate personnel to safe areas. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Keep people away from and upwind of spill/leak.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Should not be released into the environment. Prevent product from entering drains.
**Methods for containment**  
Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers).

**Methods for cleaning up**  
Soak up with inert absorbent material. Take up mechanically and collect in suitable container for disposal. Clean contaminated surface thoroughly. Prevent product from entering drains.

**OTHER INFORMATION**  
Refer to protective measures listed in sections 7 and 8.

### 7. HANDLING AND STORAGE

**Advice on safe handling**  
Provide adequate information, instruction and training for operators. Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment.

**Technical measures/Storage conditions**  
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. Keep away from open flames, hot surfaces and sources of ignition.

**Incompatible products**  
Incompatible with strong acids and bases. Incompatible with oxidizing agents, copper alloys, aluminum.
## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>NIOSH REL</th>
<th>OSHA PEL</th>
<th>Ontario TWA</th>
<th>European Union</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>TWA: 5 ppm</td>
<td>IDLH: 250 ppm Ceiling: 15.6 ppm 15 min Ceiling: 60 mg/m³ 15 min TWA: 5 ppm TWA: 19 mg/m³</td>
<td>TWA: 5 ppm TWA: 19 mg/m³ (vacated) TWA: 5 ppm (vacated) TWA: 19 mg/m³ (vacated)</td>
<td>TWA: 5 ppm Skin</td>
<td>S* TWA 7.8 mg/m³ TWA 2 ppm (3rd:) TWA 2 ppm (3rd:) TWA 8 mg/m³ (3rd:) STEL 4 ppm (3rd:) STEL 16 mg/m³ (3rd:) S*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>China</th>
<th>Japan</th>
<th>Korea</th>
<th>Australia</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>TWA: 10 mg/m³ STEL: 20 mg/m³ Skin</td>
<td>TWA: 5 ppm TWA: 19 mg/m³ Skin</td>
<td>Skin TWA: 5 ppm TWA: 19 mg/m³</td>
<td>1 ppm 4 mg/m³ Skin</td>
<td>TWA: 5 ppm TWA: 19 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Mexico</th>
<th>Brazil</th>
<th>Argentina</th>
<th>Venezuela</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>Mexico: TWA 5 ppm Mexico: TWA 19 mg/m³ Mexico: STEL 10 ppm Mexico: STEL 38 mg/m³</td>
<td>TWA: 4 ppm TWA: 15 mg/m³ Skin</td>
<td>TWA: 5 ppm Skin</td>
<td>Skin TWA: 5 ppm</td>
<td>TWA: 5 ppm TWA: 19 mg/m³ Skin</td>
</tr>
</tbody>
</table>

### Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

### Engineering measures

Handle only in a place equipped with local exhaust (or other appropriate exhaust). Drain down and flush system prior to equipment break-in or maintenance. Carry out filling operations only at stations with exhaust ventilation facilities. Ensure that eyewash stations and safety showers are close to the workstation location.

### Personal protective equipment

**Eye/face protection**

Tightly fitting safety goggles. Face-shield.

**Skin and body protection**

Wear as appropriate: Impervious clothing; Impervious gloves; Boots; Chemical resistant apron.

**Hand protection**

Fluorinated rubber, Chloroprene, Polyvinylchloride, Break through time, >60 min. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

**Respiratory Protection**

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
**Phenol**

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State @20°C</td>
<td>Solid</td>
</tr>
<tr>
<td>appearance</td>
<td>white to Amber</td>
</tr>
<tr>
<td>Odor</td>
<td>Phenolic</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>5.5</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>40 °C</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>182 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>79 °C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammable properties</td>
<td>Combustible Liquid</td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td></td>
</tr>
<tr>
<td>upper</td>
<td>8.6</td>
</tr>
<tr>
<td>lower</td>
<td>1.7</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>0.35 mmHg @ 25 °C</td>
</tr>
<tr>
<td>Vapor density</td>
<td>3.24</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.05</td>
</tr>
<tr>
<td>Water solubility</td>
<td>80 g/L @ 25 °C</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>1.46</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>715 °C</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>3 cp @ 50 °C</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>94.11</td>
</tr>
</tbody>
</table>

**Dust explosion properties**

**10. STABILITY AND REACTIVITY**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Heat, flames and sparks.</td>
</tr>
<tr>
<td>Incompatible products</td>
<td>Incompatible with strong acids and bases, Incompatible with oxidizing agents, copper alloys, aluminum.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Thermal decomposition can lead to release of irritating gases and vapors. Carbon monoxide. Carbon dioxide (CO₂).</td>
</tr>
<tr>
<td>Hazardous reactions</td>
<td>None under normal processing.</td>
</tr>
</tbody>
</table>

**11. TOXICOLOGICAL INFORMATION**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>0% of the mixture consists of ingredient(s) of unknown toxicity.</td>
</tr>
</tbody>
</table>
### Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>= 317 mg/kg (Rat)</td>
<td>= 630 mg/kg (Rabbit)</td>
<td>= 316 mg/m$^3$ (Rat) 4 h</td>
</tr>
</tbody>
</table>

### Chronic toxicity

#### Carcinogenicity
There are no known carcinogenic chemicals in this product.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>IARC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>Group 3</td>
</tr>
</tbody>
</table>

**IARC: (International Agency for Research on Cancer)**
- Group 3: Not classifiable as to its carcinogenicity to humans
- Group 3 - Not Classifiable as to Carcinogenicity in Humans

#### Irritation
Causes severe irritation and or burns.

#### Mutagenic effects
Negative in the Ames test. Positive in the chromosomal aberration assay. Positive in a micronucleus assay. In vitro tests have shown mutagenic effects. Some in vivo tests have shown mutagenic effects.

#### Reproductive toxicity
None known.

#### Target Organ Effects
Pancreas, Respiratory system, Central nervous system (CNS), Central Vascular System (CVS), Eyes, Kidney, Liver, Skin, Eyes, Kidney, Liver, Respiratory system, Skin.

### 12. ECOLOGICAL INFORMATION

#### Ecotoxicity
0% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Toxic to aquatic life.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to microorganisms</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
</table>
### Phenol

**EC50 96 h:** 46.42 mg/L (Pseudokirchneriella subcapitata)  
**L50 96 h:** 0.0188 - 0.1044 mg/L static  
**L50 72 h:** 187 - 279 mg/L static (Desmodesmus subspicatus)

**EC50 96 h:** 0.0188 - 0.1044 mg/L  
**L50 96 h:** 20.5 - 25.6 mg/L static (Pimephales promelas)

**EC50 72 h:** 32 mg/L (Pimephales promelas)  
**L50 96 h:** 5.449 - 6.789 mg/L flow-through (Oncorhynchus mykiss)

**LC50 96 h:** 7.5 - 14 mg/L static (Oncorhynchus mykiss)  
**L50 96 h:** 4.23 - 7.49 mg/L semi-static (Oncorhynchus mykiss)

**LC50 96 h:** 5.0 - 12.0 mg/L (Oncorhynchus mykiss)  
**L50 96 h:** = 13.5 mg/L static (Lepomis macrochirus)

**L50 96 h:** 11.9 - 25.3 mg/L flow-through (Lepomis macrochirus)

**LC50 96 h:** 13.5 mg/L static (Leipolx reticulata)  
**L50 96 h:** 34.09 - 47.64 mg/L static (Poecilia reticulata)

**L50 96 h:** = 31 mg/L semi-static (Poecilia reticulata)

**E50 48 h:** 4.24 - 10.7 mg/L Static (Daphnia magna)  
**EC50 96 h:** 23.28 mg/L 5 min  
**L50 96 h:** 25.61 mg/L 15 min

**EC50 96 h:** 28.8 mg/L 5 min  
**E50 96 h:** 31.6 mg/L 15 min

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### Persistence and degradability

Readily biodegradable  
The product can be degraded by abiotic (e.g. chemical or photolytic) processes

### Mobility

Not expected to adsorb on soil. The product evaporates slowly.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>1.47</td>
</tr>
</tbody>
</table>

### DISPOSAL CONSIDERATIONS

#### Waste from residues / unused products

Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. The aqueous medium should be given appropriate treatment as waste water in line with local regulations.

#### Contaminated packaging

Do not re-use empty containers. Dispose of in accordance with local regulations. Empty containers should be taken to an approved waste handling site for recycling or disposal. Can be incinerated, when in compliance with local regulations. Where possible recycling is preferred to disposal or incineration.
14. TRANSPORT INFORMATION

IMDG/IMO

Proper Shipping Name: Phenol, solid, molten
Hazard class: 6.1
UN/ID No: UN1671
Packing group: II
EmS No.: F-A, S-A
Marine pollutant: This product contains a chemical which is listed as a marine pollutant according to IMDG/IMO
Description: UN1671, Phenol, solid, molten, 6.1, II, Marine Pollutant

ICAO/IATA

UN/ID No: UN1671
Proper Shipping Name: Phenol, solid, molten
Hazard class: 6.1
Packing group: II
ERG Code: 6L
Description: UN1671, Phenol, solid, molten, 6.1, II

DOT

Proper Shipping Name: Phenol, solid, molten
Hazard class: 6.1
UN/ID No: UN1671
Packing group: II
Description: UN1671, Phenol, solid, molten, 6.1, II

ADR/RID

Proper Shipping Name: Phenol, solid, molten
Hazard class: 6.1
UN/ID No: UN1671
Packing group: II
Classification Code: T2
Special Provisions: 279
Description: UN1671, Phenol, solid, molten, 6.1, II
15. REGULATORY INFORMATION

International Inventories

All of the components in the product are on the following Inventory lists:

<table>
<thead>
<tr>
<th>Inventory List</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td>Complies</td>
</tr>
<tr>
<td>EINECS/ELINCS</td>
<td>Complies</td>
</tr>
<tr>
<td>DSL/NDSL</td>
<td>Complies</td>
</tr>
<tr>
<td>PICCS</td>
<td>Complies</td>
</tr>
<tr>
<td>ENCS</td>
<td>Complies</td>
</tr>
<tr>
<td>IECSC</td>
<td>Complies</td>
</tr>
<tr>
<td>AICS</td>
<td>Complies</td>
</tr>
<tr>
<td>KECL</td>
<td>Complies</td>
</tr>
</tbody>
</table>

Legend
TSCA (Toxic Substances Control Act)
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
PICCS - Philippines Inventory of Chemicals and Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
AICS - Australian Inventory of Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances

Restrictions - REACH Title
No information available

VIII

U.S. FEDERAL REGULATIONS

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>108-95-2</td>
<td>100</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

Acute Health Hazard: yes
Chronic Health Hazard: yes
Fire Hazard: yes
Sudden Release of Pressure Hazard: no
Reactive Hazard: no

Clean Water Act
This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
<th>CWA - Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>1000 lb</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):
Phenol

Revision Date: 17-May-2014

### Chemical Name: Phenol

<table>
<thead>
<tr>
<th>Hazardous Substances RQs</th>
<th>Extremely Hazardous Substances RQs</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 lb</td>
<td>1000 lb</td>
<td>RQ 1000 lb final RQ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RQ 454 kg final RQ</td>
</tr>
</tbody>
</table>

#### U.S. STATE REGULATIONS

**U.S. State Right-to-Know Regulations**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Legend

NPRI - National Pollutant Release Inventory

**16. OTHER INFORMATION**

- **Health Hazard**: 4
- **Fire Hazard**: 2
- **Reactivity**: 0

Issuing Date: 27-May-2012

Revision Date: 17-May-2014

**Disclaimer**

The information provided in this Material 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.