1. Identification

Product Name  Phenol

Cat No.  A92-100, A92-212, A92-500

Synonyms  Carbolic acid; Hydroxybenzene

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)

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 4</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td>Category 3</td>
<td>Acute oral toxicity</td>
</tr>
<tr>
<td>Category 3</td>
<td>Acute dermal toxicity</td>
</tr>
<tr>
<td>Category 3</td>
<td>Acute Inhalation Toxicity - Dusts and Mists</td>
</tr>
<tr>
<td>Category 3</td>
<td>Acute Inhalation Toxicity - Vapors</td>
</tr>
<tr>
<td>Category 1 B</td>
<td>Skin Corrosion/irritation</td>
</tr>
<tr>
<td>Category 1</td>
<td>Serious Eye Damage/Eye Irritation</td>
</tr>
<tr>
<td>Category 2</td>
<td>Germ Cell Mutagenicity</td>
</tr>
<tr>
<td>Category 3</td>
<td>Specific target organ toxicity (single exposure)</td>
</tr>
<tr>
<td>Category 3</td>
<td>Target Organs - Respiratory system, Central nervous system (CNS)</td>
</tr>
<tr>
<td>Category 1</td>
<td>Specific target organ toxicity - (repeated exposure)</td>
</tr>
<tr>
<td>Category 1</td>
<td>Target Organs - Liver, Kidney, Blood</td>
</tr>
</tbody>
</table>

Label Elements

Signal Word  Danger

Hazard Statements
Combustible liquid
Toxic if swallowed
Toxic in contact with skin
Causes severe skin burns and eye damage
May cause respiratory irritation
Toxic if inhaled
May cause drowsiness or dizziness
Suspected of causing genetic defects
Causes damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
Do not breathe dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep cool
Response
Immediately call a POISON CENTER or doctor/physician
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
Wash contaminated clothing before reuse
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Ingestion
Rinse mouth
Do NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Toxic to aquatic life with long lasting effects

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>108-95-2</td>
<td>&gt;95</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.
Immediate medical attention is required.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Immediate medical
Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

Ingestion
Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects
Breathing difficulties. Causes burns by all exposure routes. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: May cause central nervous system depression

Notes to Physician
Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media
No information available

Flash Point
Method - No information available

Autoignition Temperature

Upper
8.6 vol %

Lower
1.7 vol %

Sensitivity to Mechanical Impact
No information available

Sensitivity to Static Discharge
No information available

Specific Hazards Arising from the Chemical
Combustible material. Risk of ignition. Containers may explode when heated.

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

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>4</td>
<td>2</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. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Avoid dust formation. Take precautionary measures against static discharges.

Environmental Precautions
Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information. Avoid release to the environment. Collect spillage.

Methods for Containment and Clean Up
Remove all sources of ignition. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal. Avoid dust formation. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling
Use only under a chemical fume hood. Wear personal protective equipment. Avoid dust
formation. Do not breathe dust. Do not get in eyes, on skin, or on clothing. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Protect from moisture. Protect from light. Corrosives area.

8. Exposure controls / personal protection

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>TWA: 5 ppm Skin</td>
<td>(Vacated) TWA: 5 ppm Skin</td>
<td>IDLH: 250 ppm TWA: 5 ppm Skin</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>Phenol</td>
<td>TWA: 5 ppm TWA: 19 mg/m³ Skin</td>
<td>TWA: 5 ppm TWA: 19 mg/m³ STEL: 10 ppm STEL: 38 mg/m³ Skin</td>
<td></td>
</tr>
</tbody>
</table>

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures

Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection
Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection
Effective dust mask Filter type A.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>solid (crystal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless - Translucent White</td>
</tr>
<tr>
<td>Odor</td>
<td>pungent</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>6 @ 20°C 10 g/L aq.sol</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>39 - 42 °C / 102.2 - 107.6 °F</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>182 °C / 359.6 °F @ 760 mmHg</td>
</tr>
<tr>
<td>Flash Point</td>
<td>79 °C / 174.2 °F</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (solid,gas)</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability or explosive limits</td>
<td>Upper 8.6 vol % Lower 1.7 vol %</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.4 mbar @ 20 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.070</td>
</tr>
</tbody>
</table>
10. Stability and reactivity

Reactive Hazard
Yes

Stability
Hygroscopic, Light sensitive.

Conditions to Avoid

Incompatible Materials
Acids, Bases, Strong oxidizing agents, Halogens, lead, Metals

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

Hazardous Polymerization
Hazardous polymerization does not occur.

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>Phenol</td>
<td>Calc. ATE 60 mg/kg (Human evidence) 650 mg/kg (Rat; OECD 401)</td>
<td>Calc. ATE 300 mg/kg (Human evidence) 650 - 800 mg/kg (Rat)</td>
<td>Calc. ATE 0.5 mg/l (Human evidence) LC50 &gt;900 mg/m³/8h (Rat)</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
Causes burns by all exposure routes

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>Phenol</td>
<td>108-95-2</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
Experiments have shown reproductive toxicity effects on laboratory animals.

Developmental Effects
No information available.

Teratogenicity
No information available.

STOT - single exposure
Respiratory system Central nervous system (CNS)

STOT - repeated exposure
Liver Kidney Blood

Aspiration hazard
No information available
Symptoms / effects, both acute and delayed

Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting:
Product is a corrosive material. Use of gastric lavage or emesis is contraindicated.
Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: May cause central nervous system depression

Endocrine Disruptor Information
No information available

Other Adverse Effects
Tumorigenic effects have been reported in experimental animals. See actual entry in RTECS for complete information.

### 12. Ecological information

**Ecotoxicity**
The product contains following substances which are hazardous for the environment. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Contains a substance which is: Very toxic to aquatic organisms.

<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>Phenol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EC50: 187 - 279 mg/L, 72h static (Desmodesmus subspicatus)</td>
<td>4.7 mg/L LC50 96 h</td>
<td>EC50: 21 - 36 mg/L 30 min</td>
<td>EC50: 10.2 - 15.5 mg/L, 48h (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td>EC50: 0.0188 - 0.1044 mg/L, 96h static (Pseudodicrokircneriella subcapitata)</td>
<td>32 mg/L LC50 96 h</td>
<td>EC50 = 23.28 mg/L 5 min</td>
<td>EC50: 4.24 - 10.7 mg/L, 48h Static (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td>EC50 = 46.42 mg/L, 96h (Pseudodicrokircneriella subcapitata)</td>
<td></td>
<td>EC50 = 25.61 mg/L 15 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EC50 = 28.8 mg/L 5 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EC50 = 31.6 mg/L 15 min</td>
<td></td>
</tr>
</tbody>
</table>

**Persistence and Degradability**
Soluble in water Persistence is unlikely based on information available.

**Bioaccumulation/ Accumulation**
No information available.

**Mobility**
Will likely be mobile in the environment due to its water solubility.

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

### 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.

<table>
<thead>
<tr>
<th>Component</th>
<th>RCRA - U Series Wastes</th>
<th>RCRA - P Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol - 108-95-2</td>
<td>U188</td>
<td>-</td>
</tr>
</tbody>
</table>

### 14. Transport information

**DOT**

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UN1671</td>
<td>6.1</td>
<td>II</td>
</tr>
</tbody>
</table>

**TDG**

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UN1671</td>
<td>6.1</td>
<td>II</td>
</tr>
</tbody>
</table>

**IATA**

<table>
<thead>
<tr>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UN1671</td>
<td>6.1</td>
<td>II</td>
</tr>
</tbody>
</table>

**IMDG/IMO**
15. Regulatory information

All of the components in the product are on the following Inventory lists: Australia Complete Regulatory Information contained in following SDS's X = listed China Canada The product is classified and labeled according to EC directives or corresponding national laws The product is classified and labeled in accordance with Directive 1999/45/EC TSCA Korea Philippines Japan U.S.A. (TSCA) Canada (DSL/NDSL) Europe (EINECS/ELINCS/NLP) Australia (AICS) Korea (ECL) China (IECS) Japan (ENCS) Philippines (PICCS)

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>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>203-632-7</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 that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base 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

<table>
<thead>
<tr>
<th>Component</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>&gt;95</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 Yes

CWA (Clean Water Act)

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

Clean Air Act

<table>
<thead>
<tr>
<th>Component</th>
<th>HAPS Data</th>
<th>Class 1 Ozone Depleters</th>
<th>Class 2 Ozone Depleters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OSHA Occupational Safety and Health Administration
Not applicable

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)

<table>
<thead>
<tr>
<th>Component</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA EHS RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol</td>
<td>1000 lb</td>
<td>1000 lb</td>
</tr>
</tbody>
</table>

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>Phenol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</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
B3 Combustible liquid
D1A Very toxic materials
E Corrosive material
D2A Very toxic materials

16. Other information

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

Creation Date
03-Dec-2010

Revision Date
22-Jul-2016

Print Date
22-Jul-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.