

SUMITOMO
Chemical Co., Ltd



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Resorcinol

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Date Prepared: 8/November/1997

MSDS No. MJ1150-US

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name : Resorcinol
General Use : Industrial Intermediate for adhesives, dyestuffs, etc.

MANUFACTURER :
Sumitomo Chemical Co., Ltd.
27-1, Shinkawa, 2-Chome,
Chuo-ku, Tokyo 104, Japan

EMERGENCY TELEPHONE NUMBERS :
Sumitomo Chemical Co., Ltd.
TEL +81-3-5543-5838 (Japan)
FAX +81-3-5543-5818 (Japan)

2. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS No.	%	OSHA PEL	ACGIH TLV
*1,3-Dihydroxy benzene	108-46-3	99.0min	--	TWA : 10ppm(45mg/m ³) STEL : 20ppm(90mg/m ³)

*Hazardous with the meaning of 29 C.F.R. Part 1910.1200

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW : [Absorption route] Can enter the body by inhalation or through the skin. Harmful atmospheric concentrations build up very slowly, if at all, on evaporation at approx. 20° C, but harmful concentrations of airborne particles can build up much more rapidly. [Immediate effects] Irritates the eyes, skin and respiratory tract. Affects the nervous system. In serious cases risk of seizures and death. [Effects of prolonged/repeated exposure] Prolonged or repeated contact can cause skin disorders. Can affect the blood. Can cause liver, kidney and heart damage.

POTENTIAL HEALTH EFFECTS:

INHALATION : Cause irritation to respiratory tract. Sore throat, cough, shortness of breath, dizziness, cramps, unconsciousness, blue skin, feeling of weakness. (33)

EYE CONTACT : May cause irritation, possibly severe. Additional effects may include blurred vision. (34)

SKIN CONTACT : May cause irritation and skin sensitization. (2,43-53)
Additional effects may include rash, itching, bluish skin color, blood disorders and convulsions. (34)

INGESTION : May cause burns. Additional effects may include sweating, hypothermia, yellowing of the skin and eyes, stomach pain, difficulty breathing, arrhythm, hypotension, dizziness, restlessness, excitation or drowsiness, twitching, bluish skin color, lung effects, blood disorders, liver enlargement, convulsions and unconsciousness. (34)

CHRONIC : Prolonged or repeated contact can cause skin disorders. Can affect the blood. Can cause liver, kidney and heart damage. (33)

4. EMERGENCY AND FIRST AID MEASURES

- INHALATION** :Leave contaminated area immediately; breathe fresh air. Proper respiratory protection must be supplied to any rescuers. If coughing, difficult breathing or any other symptoms develop, seek medical attention at once, even if symptoms develop many hours after exposure. (35)
- SKIN CONTACT** :Flood all areas of body that have contacted the substance with water. Do not wait to remove contaminated clothing; do it under the water stream. Use soap to help assure removal. Isolate contaminated clothing when removed to prevent contact by others. (33)
Get medical attention.
- EYE CONTACT** :Remove any contact lenses at once. Flush eyes well with plenty of water or normal saline for at least 20-30 minutes. Get medical attention. (35)
- INGESTION** :If convulsions are not present, give a glass or two of water or milk to dilute the substance. Assure that the person's airway is unobstructed and contact a hospital or poison center. (35)

5. FIRE-FIGHTING MEASURES AND EXPLOSION HAZARD DATA

- FLASH POINT and METHOD** :164° C (Seta closed cup)
- FLAMMABLE LIMITS** :Lower: 1.4 %; Upper: Not known
- LOWER LIMIT OF DUST EXPLOSION**:30 g/m³
- AUTOIGNITION TEMPERATURE** :808° C
- DUST EXPLOSION LIMITS** :Lower : Not known , Upper : Not known
- EXTINGUISHING MEDIA** :Water, carbon dioxide, dry chemical powder and chemical foam
- SPECIAL FIRE-FIGHTING PROCEDURES** :Wear rubber gloves, safety goggles with face shield, protective clothing and self-contained breathing apparatus.
- UNUSUAL FIRE and EXPLOSION HAZARDS** :Container explosion may occur under fire conditions. When exposed to heat or flame, can react with oxidizing materials. Keep dust from accumulating.
- HAZARDOUS DECOMPOSITION PRODUCTS** :May generate COx when heated to burning.

6. ACCIDENTAL RELEASE MEASURES

GENERAL : Eliminate all ignition source immediately, and ventilate the area. Reduce airborne dust and prevent scattering by moistening with water.
 Wear appropriate personal protective equipments (see Section 8.) in cleaning up operation.
 In case of ignition, install extinguisher.
 Consult an expert on the disposal of recovered material. Ensure disposal is in compliance with government requirements and ensure conformity of local disposal regulations.
 Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

LAND SPILL : Absorb the spill onto paper towels and allow to evaporate in a fume-cupboard.
 For large spills, absorb onto sand or vermiculite, and remove in buckets for atmospheric evaporation in a safe area. Ideally, waste should be burned in an incinerator with after burner.

7. HANDLING AND STORAGE

PRECAUTIONS : Handle with an approved respirator, chemical resistant gloves, safety goggles and other protective clothing in well-ventilated place. (Ex. in chemical fume hood) (30)
 Equip an eyewash facility and safety shower for emergency near handling and storing place.
 Wash hands and face after handling.
 Store in cool, dry, dark and well-ventilated place. Keep in a tightly closed container.
 Avoid moisture, exposing to sunlight, and contacting with metals such as iron or copper (other than aluminum or stainless steel). Keep away from all source of ignition.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING CONTROLS (VENTILATION) : Adequate ventilation should be required when handling or using this product. Keep dust concentrations below the recommended TLV. Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present. (34)

ACGIH TLV : TWA 10 ppm (45 mg/m³); STEL 20 ppm (90 mg/m³) (32)
OSHA PEL : Not established (31)

PERSONAL PROTECTION

RESPIRATORY : Wear an appropriate NIOSH/MSHA-approved respirator. (37)

PROTECTIVE GLOVES : Wear chemical resistant gloves.

EYE PROTECTION : Wear splash-proof or dust-resistant safety goggles or equivalent eye protection.

OTHER : Wear appropriate protective (impervious) clothing to prevent skin contact.
 Equip an eyewash facility and safety shower for emergency near handling and storing place.

WORK/HYGIENIC PRACTICES : Always clean protective equipment and workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	:White or pale yellow flakes		
ODOR	:Slightly phenolic odor	VAPOR PRESSURE	:133.3Pa at 105° C
MELTING POINT	:109~111° C	SPECIFIC GRAVITY	:1.285 (15/4° C)
BOILING POINT	:281° C / 101.3kPa	SOLUBILITY in water	:110 g / 100ml
VAPOR DENSITY	:3.8	pH	:Not known
PERCENT VOLATILE	:Not known	EVAPORATION RATE	:Not known
Log Pow	:0.8		

10. STABILITY AND REACTIVITY

STABILITY	:Stable at normal condition.		
HAZARDOUS POLYMERIZATION	:Will not occur		
CONDITIONS TO AVOID	:High temperature		
INCOMPATIBILITY	:Moisture, strong oxidant, Iron, copper		
HAZARDOUS DECOMPOSITION PRODUCTS	:Combustion will produce CO.		

11. TOXICOLOGICAL INFORMATION

ACUTE INHALATION EFFECTS	:A survey of 180 men employed in work involving resorcinol revealed no complaints of irritation or discomfort at exposure levels of 10 ppm.(34) Laboratory animals exhibited no toxic signs or symptoms from exposure to 7800 mg/m ³ for 1 hour or 2800 mg/m ³ for 8 hours. However, exposure to very high concentrations may result in systemic poisoning as detailed in acute ingestion.(34)
EYE EFFECTS	:10 % solution caused pain, conjunctival inflammation and vascularization of cornea in the rabbit eyes.(38) Dry, powdered resorcinol applied to rabbit eyes induced necrosis sufficient to cause perforation of cornea or extensive vascularization.(38) One hundred mg of resorcinol applied to rabbit eyes induced severe eye irritation.(2)
SKIN EFFECTS	:Dermal LD ₅₀ value for rabbits have been reported as 3,350 mg/kg.(9) Twenty mg of resorcinol occlusively applied to rabbit skin for 24 hours induced moderate skin irritation.(2) A 3-25 % solution of resorcinol may cause itching, redness, dermatitis, and edema or corrosion. Skin sensitization and cross-reactivity to other phenolics have been reported in some clinical case studies.(43-53) No skin sensitization was reported in guinea pigs.(54-55) It may be absorbed through the skin in suitable solvent causing symptoms similar to those of ingestion. Skin absorption under normal conditions is slight.(36)

11. TOXICOLOGICAL INFORMATION(continued)

- ACUTE ORAL EFFECTS** :Oral LD₅₀ values for rats and mice have been reported as 301-380 mg/kg and 200 mg/kg, respectively.(2,3)
Ingestion of 8 grams in a child induced an almost immediate hypothermia, hypotention, bradypnea with tremors, tetanus and hemoglobinuria. However, other cases have been reported in which similar doses apparently produced no ill effects.(34)
Pathological findings reported in humans include necrosis of the mucous membranes, marked siderosis, siderotic splenomegaly, marked tubular degeneration of the kidney, fatty changes and anemia of the liver, possibly bladder necrosis, fatty changes of the myocardium, edema and emphysema of the lungs and cerebral edema.(34)
Ingestion may cause necrosis of the mucous membranes and abdominal pain. Resorcinol is readily absorbed from the gastrointestinal tract and may cause systemic poisoning. Symptoms may include sweating, greenish or bluish colored urine, methemoglobinemia, Heinz bodies, cyanosis, convulsions, hemolytic anemia, dyspnea, hepatomegaly, jaundice, splenomegaly and edema. Central nervous system stimulation with restlessness, dizziness, tachycardia, and convulsions, followed by somnolence and unconsciousness may occur. Death is due to respiratory failure.(34)
- SUBCHRONIC EFFECTS** :No evidence of toxic effects was noted when rats, guinea pigs and rabbits were exposed six hours per day for a period of 2 weeks to concentrations of 34 mg/m³.(34)
In subchronic feeding and dermal studies in rats and mice, no significant effects were observed.(55)
- CHRONIC EFFECTS/CARCINOGENICITY :**
Negative results were obtained in any carcinogenicity studies by gavage in rats (112~225mg/kg/day in male and 50~150mg/kg/day in female)and in mice (112~225mg/kg/day)for 2 years, and by dermal application of 5~50 % acetone solution of resorcinol in mice and rabbits for their lifetime(max.100weeks in mice and 160weeks in rabbits).(1,57,58)
Resorcinol is listed as the agent that is not classifiable as to its carcinogenicity to humans (Group 3) in IARC.(39)
- MUTAGENICITY** :Resorcinol has been reported to damage DNA of liver cells in rats, and to induce mutations in yeasts and mouse lymphocytes, and also induce chromosome aberrations in human lymphocytes. Both positive and negative results have been obtained in Salmonella Ame's test, chromosome aberration test with Chinese hamster cells. Negative result has been obtained in DNA damage test with rat liver cells, Drosophila gene mutation test, and micronucleous test and sister chromatid exchange test with rats and mice.
(2,4,5,6-30)
- TERATOGENICITY** :At levels which were not overtly maternally toxic, resorcinol was not teratogenic in rats following administration by gavage on days 6-15 of pregnancy.
It was not teratogenic when applied topically to pregnant rats. (36)

12. ECOLOGICAL INFORMATION

- BIODEGRADABILITY** : Biodegradable (40)
- FISH ACUTE TOXICITY** (fathead minnow)
: LC₅₀ (96 hr) = 53.4 ppm (41)
Dangerous for the environment(The twenty-second time Council Directive 67/548/EEC ANNEX I)
- LOG Pow** : 0.8 (42)

13. DISPOSAL CONSIDERATIONS

Burn in a controlled incinerator.

Dispose in accordance with federal, state and local regulations. The owner of the material is responsible for proper waste disposal.

14. TRANSPORT INFORMATION

UN class : 6.1 (Toxic)
Packaging group : III
UN No. : 2878

15. REGULATORY INFORMATION (not meant to be all inclusive)

USA/TSCA : Listed on TSCA Inventory.
HCS : Hazardous with the meaning of 29 CFR 1910.1200
CERCLA : Reportable quantity is 5000 pounds.

INTERNATIONAL
EU/EINECS/ELINCS : Listed on EINECS (No.2036852)
CANADA/CEPA : Listed on DSL
Australia : Listed on AICS
JAPAN : MITI No.(9)-543
KOREA : Listed on TCCL Inventory(No.KE-02557)

16. OTHER INFORMATION

REVISION SUMMARY: Revised due to amendment of contents in section 3,11,12,15 and 18.

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End of MSDS

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