Marubeni U 83010 10236

MATERIAL SAFETY DATA SHEET

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PHENOL, 90% SOLUTION

SECTION 1 – Chemical Product Information

Product name: Phenol
Synonym: Hydroxybenzene, phenyl alcohol, carbolic acid *and others*
Europe ELINCS/EINECS #: 203-632-7
Material Use: Mfg of: phenolic resins, bisphenol A, caprolactam, etc; disinfectant, *& others*

SECTION 2 – Composition/Information on Ingredients

Name	CAS #	%	TLV Ppm/mg/m^3	LD_{50} ORAL	(mg/kg) SKIN	LC_{50} ppm INHALATION
Hydroxybenzene	108-95-2	90	5 / 19 (skin)	279	500	46

SECTION 3 – HAZARD IDENTIFICATION

Rapid Hazard Guide: combustible liquid & vapour, highly toxic by ingestion & by skin absorption, corrosive to living tissue

WHMIS Class (Canada): B 3, D 1A, E
Key: B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C
D 1 – Immediately Toxic, D 2 – Chronic Toxicity
C – Oxidizing Substance, E - Corrosive
HMIS Rating (U.S.A.): Health – 4, Fire – 2, Reactivity - 2
Key: 0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

SECTION 4 – FIRST AID MEASURES

Skin: Immediately, apply a 50% solution in water of Polyethylene Glycol PEG 300 or 400 to skin and wipe the affected area. Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly cleaned or laundered. Seek medical help promptly if there is persistent itching or redness in the affected area.

Eyes: Wash eyes with plenty of water, holding eyelids open for 60 minutes *(by the clock)*. Seek medical assistance promptly, but keep emergency vehicle waiting while washing continues.

Inhalation: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If victim's breathing stops, administer artificial respiration and seek medical aid promptly.

Ingestion: Give 250-300ml of water to dilute the product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below the hips to prevent inhalation of vomited material. Repeat the water after vomiting. Seek medical help promptly.

SECTION 5 – FIRE FIGHTING MEASURES

Flash Point: 79°C / 175°F (closed cup)
Autoignition Temperature: 715°C / 1319°F
Flammable Limits: 1.3% - 9.5%
Combustion Products: Carbon monoxide, nitrogen oxides, part oxidized hydrocarbon fragments including aldehydes, acids, and acrid smoke
Firefighting Precautions: Foam, dry chemical, water fog or spray to cool & dilute; firefighters *must* wear full-body encapsulating chemically resistant suit and use positive pressure SCBA
Static Discharge: Cannot accumulate a static charge

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Leak Precaution: Dyke to control spillage and prevent environmental contamination
Handling Spill: Ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on sand or vermiculite, pick up using non-sparking plastic shovel, & store in labeled, closed containers for disposal

NOTE: Wear a respirator with organic vapour cartridge AND a full-body chemical resistant suit.

SECTION 7– HANDLING AND STORAGE

Store and use in a cool dry environment, away from sources of ignition, heat and substances named in Part VII. Phenol gradually darkens on exposure to light, acquiring a pink tinge.

Empty containers may contain a flammable/explosive vapour. Never cut, drill, weld or grind on or near this container, whether empty or full. *Always replace drum, pail or IBC cap prior to moving the container!*

Avoid breathing product mist. Use in a fully enclosed apparatus, with adequate point-source ventilation to maintain airborne concentration of the product below the TLV (see IV, IX above). If dealing with a spikk, and ventilation is impractical, wear a suitable respirator (part IX). Avoid all contact with skin and wash work clothes frequently. An eye bath and safety shower should be available near the workplace.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

ACGIH TLV: 5ppm / 19mg/m^3 (skin)
OSHA PEL: 5ppm / 19mg/m^3 (skin)
STEL: Not listed
Ventilation: Closed handling system is the preferred method to minimize exposure; point source mechanical ventilation may be required to maintain airborne vapour or mist concentrations below TLV; a respirator with organic vapour cartridge & a dust/mist filter should be available for "escape" purposes, should ventilation fail *(always store respirator in an airtight container [eg: "Tupperware"] to maintain cartridge "freshness")*

NIOSH/OSHA RECOMMENDATIONS FOR PHENOL CONCENTRATIONS IN AIR:
Up to 50 ppm: Chemical cartridge respirator with organic vapour cartridge(s) and dust and mist filter(s); or SAR (supplied Air Respirator).
Up to 125 ppm: SAR operated in a continuous-flow mode; or powered air-purifying respirator with organic vapour cartridge(s) and dust and mist filter(s).
Up to 250 ppm: Full facepiece chemical cartridge respirator with organic vapour cartridge(s) and high-efficiency particulate filter(s); or gas mask with organic vapour canister and high-efficiency particulate filter; or powered air-purifying respirator with a tight-fitting facepiece and organic vapour cartridge(s) and having a high-efficiency particulate filter; or full facepiece SCBA; or full-facepiece SAR.

Hands: Gauntlet-style butyl or "Viton" gloves – *always confirm suitability with supplier*
Eyes: Chemical goggles, a face shield is recommended if splashing is possible
Clothing: Impermeable (hands, above) apron, boots, long sleeves, if splashing is possible; if splashing is likely, a full body chemical resistant suit may be required

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Odour & Appearance: Clear, colourless to pale pink, liquid with sweet, acrid, tarry odour
Odour Threshold: 0.06ppm – highly variable
Vapour Pressure: 0.357mmHg / 0.048kPa (20°C/68°F)
Evaporation Rate *(Butyl Acetate=1)*: Not known – below 0.1
Vapour Density (air=1): 3.2

Boiling Point:	182°C / 359°F
Freezing Point:	12.6°C / 55°F
Specific Gravity:	1.065 (20/20°C)
Water Solubility:	Approximately 70grams per litre (20°C / 68°F); completely soluble above 65°C
-in other solvents	Aromatic hydrocarbons, alchol, diethyl ether, acetone, carbon disulphide, alkalies
Viscosity:	11 centipose (20°C / 68°F)
pH:	6
Conversion Factor:	1ppm = 3.84mg/m^3
Molecular Weight:	94 grams per mole

SECTION 10 – STABLITY AND REACTIVITY

Dangerously Reactive With:	Strong oxidizing agents; polymerises in the presence of alkalies; formaldehyde, nitrobenzene or aluminum chloride may cause an explosion
Also Reactive With:	Reducing agents release hydrogen gas; hot phenol attacks aluminum, magnesium, lead and zinc; attacks some plastics, rubbers and coatings
Chemical Stability:	Stable; will not polymerize
Decomposes in Presence of:	light
Decomposition Products:	None apart from Hazardous Combustion Products
Mechanical Impact:	Not sensitive

SECTION 11 – TOXICOLOGICAL INFORMATION

i. EFFECTS OF ACUTE EXPOSURE

Skin Contact:	Corrosive to skin; *anaesthetic effect can mask pain sensation*; muscle weakness, tremors, loss of co-ordination, convulsions, collapse, circulatory collapse, death
Skin Absorption:	Yes, *extensive exposure (~25% of body surface) to concentrated product may be lethal by this route*
Eye Contact:	Corrosive to eyes, may cause permanent damage – even blindness
Inhalation:	Does not form vapour; mists pressured to be corrosive to respiratory tract
Ingestion:	Lowest lethal dose estimated as 140ml; 15ml has caused death!; severe irritation, burns and swelling to mouth, throat and stomach; internal bleeding, falling blood pressure, collapse, death

ii. EFFECTS OF CHRONIC EXPOSURE

General:	Following long-term contact: vomiting, difficulty swallowing, diarrhea, loss of appetite, headache, fainting dizziness, mental disturbances & dark urine; skin discolouration & eruptions also observed
Sensitizing:	Not a sensitizer
Carcinogen/Tumorigen:	Not known to be a tumorigen or a carcinogen in humans or animals
Reproductive Effect:	No known effect on humans or animals
Mutagen:	Not known to be a mutagen or teratogen in humans or animals
Synergistic With:	Not known
LD_{50} (oral):	352 – 569mg/kg (rat), 300mg/kg (mouse)
LD_{50} (skin):	700, 743 & 944mg/kg (rabbit), 744 & 1666mg/kg (rat), 556mg/kg (pig)
LD_{50} (inhalation):	46ppm (mouse), 82ppm (rat)

SECTION 12 – ECOLOGICAL INFORMATION

Bioaccumulation:	This product is readily eliminated or metabolized (biological ½-life = 13 hr) and cannot bioaccumulate
Biodegradation:	This product degrades readily and rapidly in the presence of oxygen; 39% degradation in 12 hours
Abiotic Degradation:	This product reacts with atmospheric hydroxyl (OH) radicals; its estimated half-life in air is 14-15hr
Mobility in soil, water:	This product is water soluble, does not absorb to soil & should move readily through soil and the water column; rapid biodegradation may help limit movement
Marine Toxicity	

LD_{50} (96hr, fish):	8.9-12.3mg/litre (Oncorhynchus mykiss), 11.5-50.9mg/litre (Pimephelas promelas), 47.5mg/litre (Lebistes reticulates), 40mg/litre (Poecilia reticulate), 27.8mg/litre (Brachydanio rerio)
LD_{50} (48hr, crustacea):	10.2-15.19mg/litre (Daphnia magna)
EC_{50} (Algae):	370mg/litre (Chlorella vulgaris & Microcystis aeruginosa), 150mg/litre (Selenastrum capricornutum)
EC_{50} (Bacteria)	21-40mg/litre (Photobacterium phosphoreum)

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste disposal: Do not flush to sewer; may be incinerated in approved facility with flue gas monitoring & scrubbing, mix with a suitable flammable waste before incineration

Containers: Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.
Pails must be vented and thoroughly dried prior to crushing and recycling.
IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5 years). Steel containers must be inspected, pressure tested & recertified every 5 years.

Warning: never cut, drill, weld or grind on or near this container, even if empty.

SECTION 14 – TRANSPORT INFORMATION

USA 49 CFR

Product Identification Number:	UN - 2821
Shipping Name:	Phenol solution
Classification:	Class 6.1; Packing Group II
Label	

Canada TDG

Product Identification Number:	UN - 2831
Shipping Name:	Phenol solutions
Classification:	Class 6.1; Packing Group II
Marine Pollution:	*Not a marine pollutant*

SECTION 15 – REGULATORY INFORMATION

Canada DSL:	On inventory
U.S.A. TSCA:	On inventory
Europe EINECS:	On inventory

SECTION 16 – OTHER INFORMATION

Supplier MSDS Date: 02/27/2012

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