VELSICOL CHEMICAL LLC

Material Safety Data Sheet

HCS Risk Phrases
HCS CLASS: DANGEROUS MAY CAUSE CANCER based on Chlorendic acid. HCS CLASS: Irritating substance. HCS CLASS: Sensitizing substance.

Section 1. Chemical Product and Company Identification

Common Name/ Trade Name	**Chlorendic Anhydride PE1+**	In Case of Emergency	In the continental U.S.A. call CHEMTREC 800-424-9300 (24 hours) Outside the continental U.S.A. call CHEMTREC 703-527-3887 (24 hours)
Supplier	Velsicol Chemical LLC 10400 W. Higgins Road Rosemont, Illinois 60018 USA Phone: (847) 813-7888 Fax: (847) 298-9015	Manufacturer	Jiangsu Anpon Electrochemical Co., Ltd 30 Huagong Road, Huaian, Jiangsu, China Tel: 0517-83556373 Fax: 0517-83635571 Email: Wangsk@anpon.com
Synonym	4,5,6,7,8,8-Hexachloro-3a,4,7,7a-tetrahydro-4, 7-methanoiso benzofuran-1, 3-dione	Material Uses	Industrial applications: Hardener for epoxy resins, paints, and coatings. Other non-specified industry: Flame retardant in unsaturated polyester resins.
Chemical Name	1,4,5,6,7,7-hexachloro-8,9,10-trinorborn-5-ene-2,3-dicarboxylic anhydride		
Chemical Family	Chlorinated Bicyclic Anhydride	Chemical Formula	C9 H2 CI6 03

Section 2. Hazards Identification

Emergency Overview	White to yellowish fine crystalline solid. No distinctive odor. WARNING! MAY BE HARMFUL IF SWALLOWED. CAUSES EYE IRRITATION MAY CAUSE SKIN AND RESPIRATORY TRACT IRRITATION MAY CAUSE ALLERGIC SKIN REACTION. ATTENTION! POSSIBLE CANCER HAZARD CONTAINS CHLORENDIC ACID WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA Risks of cancer depends on duration and level of exposure.
OSHA Regulatory Status	Not regulated.
Potential Health Effects	Inhalation and skin contact are expected to be the primary routes of occupational exposure to Chlorendic Anhydride PE1+. This material is irritating to the eyes, skin and respiratory tract. Allergic skin reaction may occur in susceptible individuals. Chlorendic Anhydride PE1+ is considered, on the basis of single exposure (acute) animal tests, to be slightly toxic after ingestion (swallowing), practically non-toxic after inhalation and skin contact, severely irritating to eyes and practically non-irritating to skin. Chlorendic Anhydride PE1+ will slowly degrade to chlorendic acid in the presence of water and/or sunlight. The National Toxicology Program (NTP) has concluded that there is clear evidence of carcinogenicity (cancer) in a feeding study of rats and mice using chlorendic acid. International Agency for Research on Cancer (IARC) has given chlorendic acid an overall evaluation of 2B (possibly carcinogenic).
Potential Environmental Effects	See Section 12

Section 3. Composition / Information on Ingredients

Name	CAS#	% by Weight
1) Chlorendic Anhydride	115-27-5	> 95.0
2) Chlorendic Acid	115-28-6	< 3.0
3) Maleic anhydride	108-31-6	< 1.0
4) Chlorobenzene	108-90-7	< 5.0

Section 4. First Aid Measures	
Eye Contact	Immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin Contact	Immediately wash skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated shoes.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	If swallowed, induce vomiting as directed by medical personnel. Get medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
Note to Physicians	No additional remark

Section 5. Fire Fighting Measures	
Flammability Properties	Non-flammable.
Suitable Extinguishing Media	Use dry chemical, alcohol foam or CO_2. Water or foam may cause frothing.
Unsuitable Extinguishing Media	Not available
Specific Hazards Arising From Chemical	Not considered to present risks of explosion. However, contains up to 5% occluded chlorobenzene, which can present a fire hazard if sufficient oxygen and a source of ignition is present. Ground containers and equipment to avoid static charge accumulation and/or use an inert atmosphere to prevent combustion.
Protective Equipment and Precautions for Firefighters	Non-flammable.

Section 6. Accidental Release Measures	
Personal Precautions	Chemical resistant coveralls, gloves and boot covers. Shoes/boots. A full-face piece respirator with dual organic vapor and particulate matter cartridge is recommended.
Environmental Precautions	Not available
Methods for Containment	Use appropriate tools to put the spilled solid in a convenient waste disposal container.
Methods for Clean-Up	Stop the leak if possible. Ventilate the area involved. Sweep up the material and place in container for later disposal.

Section 7. Handling and Storage	
Handling	Do not taste or swallow. Avoid breathing dust. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.
Storage	Store in ventilated area away from sources of ignition.

Section 8. Exposure Controls/Personal Protection	
Exposure Limits:	CAS# 108-31-6: United Kingdom, WEL - TWA: 1 mg/m3 TWA, WEL - STEL: 3 mg/m3 STEL United States: TWA: 0.25 ppm from OSHA/NIOSH; TWA: 0.25 ppm from ACGIH.
Engineering Controls	Investigate engineering techniques to reduce exposures. Provide ventilation if necessary to minimize exposure. If practical use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.
Personal Protective Equipment	Chemical resistant coveralls, gloves and boot covers. Shoes/boots. A full-face piece respirator with dual organic vapor and particulate matter cartridge is recommended. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Section 9. Physical and Chemical Properties	
Physical State / Appearance	Powder
Color	White.
Odor	No distinctive odor.
Odor Threshold	Not available
pH (1% soln/water)	Not applicable
Melting Point/Freezing Point	235°C (455°F)
Boiling Point	Not available
Flash Point	Not applicable
Evaporation Rate	Not available
Flammability	Non-flammable
Flammable Limits	Not applicable
Vapor Pressure	2 mm of Hg (@ 20°C)
Vapor Density	13 (Air = 1)
Specific Gravity	1.73 (Water = 1)
Solubility	Easily soluble in acetone. Soluble in methanol, diethyl ether, and n-octanol. Insoluble in cold water, hot water.
Partition Coefficient	Octanol / water = 2.21; 1,2-dichlorobenzene/water = 0.49

Auto-Ignition Temperature	Not applicable
Decomposition Temperature	Not available
Critical Temperature	Not available
Volatility	Not available
Viscosity	Not available
Molecular Weight	371

Section 10. Stability and Reactivity Data

Chemical Stability	The product is stable.
Conditions to Avoid	No additional remark.
Incompatible Materials	Highly reactive with oxidizing agents, organic materials. Slightly reactive to reactive with reducing agents, acids, alkalis. Very slightly to slightly reactive with metals.
Hazardous Decomposition Products	Not available
Possibility of Hazardous Reactions	Not available

Section 11. Toxicological Information

Toxicity to Animals

115-27-5, Chlorendic Anhydride in RTECS (# RB9080000):
Draize test, rabbit, eye: 100 mg Severe;
Inhalation, rabbit: LC50 = >1 gm/m3;
Inhalation, rat: LC50 = >1 gm/m3;
Oral, mouse: LD50 = 2400 mg/kg;
Oral, rat: LD50 = 2300 mg/kg;
Skin, rabbit: LD50 = >3 gm/kg.

Allergic skin reaction was reported in guinea pigs after repeated skin application. Repeated skin contact produced skin irritation, stomach lesions, diarrhea, nasal and eye discharge, decreased activity, anorexia and dehydration in rats. Decreased body weights, decreased food consumption and changes in heart, liver, kidney and spleen weights were reported after repeated dietary administration to rats. Repeated inhalation of dust produced nasal and eye irritation, salivation, hair loss, decreased body weight gain, liver and thyroid changes, lesions in the lung and stomach and cellular changes in the respiratory tract and stomach. No birth defects were reported in the offspring of rats given Chlorendic anhydride orally during fetal development. No genetic changes were reported in standard tests using animals and animal and bacterial cells. Genetic changes were reported in a standard test using human cells.

108-31-6, Maleic anhydride in RTECS (#ON3675000):
Dermal, guinea pig: LD50 = >20 gm/kg;
Draize test, rabbit, eye: 1% Severe;
Oral, mouse: LD50 = 465 mg/kg;
Oral, rabbit: LD50 = 875 mg/kg;
Oral, rat: LD50 = 400 mg/kg;
Skin, rabbit: LD50 = 2620 mg/kg.

115-28-6, Chlorendic Acid in RTECS (#RB9000000):
Draize test, rabbit, eye: 250 ug/24H Severe;
Draize test, rabbit, skin: 500 mg/24H Mild.

The National Toxicology Program (NTP) has concluded that there is clear evidence of carcinogenicity (cancer) in a feeding study of rats and mice using Chlorendic acid. International Agency for Research on Cancer (IARC) has given Chlorendic acid an overall evaluation of 2B (possibly carcinogenic).

108-90-7, Chlorobenzene:
Oral, LD50, Rat: 1110 mg/kg; Mouse: 2300 mg/kg.

Section 12. Ecological Information

Ecotoxicology	*115-27-5, Chlorendic Anhydride:* 48-hour LC50: 110.7 ppm Daphnia magna, practically non-toxic 96-hour LC50: 422.7 ppm Bluegill sunfish, practically non-toxic 96-hour LC50: 422.7 ppm Rainbow trout, practically non-toxic
Chemical Fate	Chlorendic anhydride is not likely to bioconcentrate. It is rapidly degraded by light to Chlorendic acid. The half-life is 140+/-37 days.

Section 13. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local or regional authorities for disposal options.

Section 14. Transport Information

DOT	Not a DOT controlled material
IMDG Classification	IMDG Class: 9 UN Number: 3077 Packaging group: III Proper shipping name: Environmentally hazardous substance, solid, n.o.s.
ADR Classification	Environmentally hazardous substance. (Europe).
Additional Information	No additional remark

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations	All components of this product are in compliance with the following Inventories: United States (TSCA) Canada (DSL) Australia (AICS) China (IECSC) European Union (EINECS) Japan (ENCS) Korea (ECI) New Zealand (NZIoC) Philippines (PICCS) This product contains a chemical known to the State of California to cause cancer (Chlorendic Acid).			
European Labeling	Xi, T Symbol; R36/37/38 – Irritating to eyes, respiratory system and skin. R45 – May cause cancer. R52/53 – Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S24/25 – Avoid contact with skin and eyes. S36/37/39 – Wear suitable protective clothing, gloves and eye/face protection. S61 – Avoid release to the environment. Refer to special instructions/Safety data sheets.			
Other Classifications	WHMIS (Canada)	WHMIS class D-2B: Material causing other toxic effects (TOXIC)		
HMIS (U.S.A.)	Health Hazard	1*	National Fire Protection Association (U.S.A.)	Health 1
	Fire Hazard	1		Fire Hazard 1
	Reactivity	1		Reactivity 1
	Personal Protection			Specific Hazard

Section 16. Other Information

References	-REGISTRY Database, Chemical Abstract Service -CHEMLIST Database, Chemical Abstract Service -Registry of Toxic Effects of Chemical Substances (RTECS), -Hazardous Substance Data Bank (HSDB), National library of Medicine, #2920 -LOLI Database -ICRMS North American Database, Ariel Research Corporation -ICRMS European Database, Ariel Research Corporation -ICRMS Inventories Database, Ariel Research Corporation -Product Information Bulletin, Velsicol Chemical LLC -Material Safety Data Sheet, Velsicol Chemical LLC -Velsicol Chemical LLC, unpublished studies
Other Special Considerations	No additional remark
Prepared By & Date	Dawei Li, 06/14/2010
Supersedes	Dawei Li on 02/17/2010
Revision	Update to Section 1,14
Notice to Reader	*To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.*