Oxalic Acid: Material Safety Data Sheet

Section 1 :Product and Company Identification

Product Name	Oxalic Acid
Chemical Family	Organic Acid
Chemical Name	Oxalic Acid Dihydrate
Synonym(s)	Ethanedoic Acid Dihydrate
CAS Number	6153-56-6
Formula	$(COOH)_2.2H_2O$
Manufacturer / Supplier Data	Radiant Indus Chem Pvt. Ltd., F-15 MIDC Industrial Area, Chikalthana, Aurangabad(MS) India – 431210
Telephone Fax	+91-240-2482450 / 2482950 +91-240-2485450

Section 2: Composition/Information on Ingredients

CAS Number	EINECS Number	Chemical Name	% by weight
144-62-7	205-634-3	Oxalic Acid, anhydrous	-
6153-56-6	Unlisted	Oxalic Acid Dihydrate	99.5-100

Section 3 : Hazards Identification

Emergency Overview: Danger! May be fatal if swallowed. Corrosive. Causes severe irritation and burns to the skin, eyes and respiratory tract. Harmful if inhaled or absorbed with skin. May cause kidney damage.

Potential Health Effects

Routes of Entry:	Inhalation, Ingestion, Eye Contact and Skin Contact
Target Organs:	Eyes, Skin, Respiratory System and Kidneys
Skin Contact:	Skin contact may cause irritation with symptoms of redness, swelling, itching and pain.
Eye Contact:	Eye contact may cause irritation with symptoms of redness, swelling, itching and pain. May cause Corneal injury.
Inhalation:	Inhalation of Oxalic Acid produces irritation of respiratory tract, cough and vomiting.
Ingestion:	Oxalic Acid is toxic. As little as 5 gms may be fatal. Ingestion may cause Gastroenteritis, burns, nausea, vomiting, shock and convulsions. Oxalic Acid removes Calcium from the blood as Calcium Oxalate. Calcium Oxalate thus formed might precipitate in the kidney tubules.
Chronic Exposure:	Inhalation of Oxalic Acid over a long period of time may cause inflammation of respiratory tract and might result in weight loss. It may also result in Urolithiasis (the formation of urinary stones).
Explanation of Carcinogenicity:	None.
Medical conditions aggravated by exposure:	Persons with preexisting eyes or skin conditions or impaired pulmonary function may be more susceptible to the effects of this product.

Section 4: First Aid Measures

Eyes:	Incase of contact, immediately flush eyes with plenty of water for atleast 15 minutes. Get medical aid immediately.
Skin:	Incase of contact, immediately flush skin with plenty of water for atleast 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion:	If swallowed, do NOT induce vomiting. If conscious give water, milk or Milk of Magnesia. Never give anything by mouth to an unconscious person. Call a Doctor immediately.
Inhalation:	If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult give Oxygen. Get medical aid immediately.

Section 5: Fire Fighting Measures

Auto Ignition Temperature	N/A
Flash Point	N/A
Explosion Limits	N/A
Unusual Fire and Explosion Hazards	Oxalic Acid is combustible below 101°C (215 °F). Decomposition products include carbon monoxide and formic acid which are toxic and flammable. Reacts explosively with strong oxidizing materials and some silver compounds.
Extinguishing Media	Use water spray, dry chemical, Carbon Di Oxide or alcohol foam. Foam or water on molten Oxalic Acid may cause frothing.
NFPA Rating	Health: 3; Flammability: 1; Reactivity: 0
Special Information	Fire fighters should wear a full protective gear, with a self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

Section 6: Accidental Release Measures

General Information: Remove all sources of ignition. Ventilate area of leak or spill. Utilize recommended protective clothing and equipment as specified in section 8.

Spills: Clean the spill in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Pick up spill for recovery or disposal and place in closed container. Spill area can be washed with water. Collect wash water for approved disposal. Water disposal should be in accordance with existing federal, state and local environmental regulations.

Section 7: Handling and Storage

Handling:	Wash thoroughly after handling. Do not ingest or inhale. Do not get in eyes, on skin or on clothing. Minimize dust generation and accumulation.
Storage:	Store in a cool, dry and well-ventilated area away from heat and incompatible substances (refer section 10). Keep container tightly closed.

Section 8: Exposure Controls /Personal Protection

Engineering Controls:
Facilities storing or utilizing the material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentration below the permissible limits.

Exposure Limits:

Chemical Name	OSHA	NIOSH	ACIGH
Oxalic Acid, anhydrous	1mg/m^3 TWA	1mg/m^3 TLV-TWA	1mg/m^3 TLV-TWA
	2mg/m^3 STEL	2mg/m^3 TLV-STEL	2mg/m^3 TLV-STEL
		500mg/m^3 IDLH (NOISH)	
Oxalic Acid Dihydrate	Not Listed	Not Listed	Not Listed

Personal Protective Equipment:

Eyes:	Use chemical safety goggles or eyeglasses. A face shield may also be necessary. Maintain eye was fountain and safety showers in the immediate work area.
Skin:	Wear impervious protective clothing including apron, boots and rubber gloves as appropriate.
Ventilation:	Use local ventilation if dusting is a problem, to maintain air levels below the recommended exposure limit.
Personal respirators:	Approved respirators should be used if airborne concentration exceeds recommended limit. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Section 9: Physical and Chemical Properties

Physical State	Solid
Appearance	White crystalline powder
Odor	Odorless
Molecular Formula	$(COOH)_2.2H_2O$
Molecular Weight	126.07 (dihydrate) 90.03 (anhydrous)
pH	1.3 (0.1M solution in water)
Vapor pressure	Less than 0.001 mm Hg @ 20°C (68°F)
Vapor Density	4.4 (Air = 1)
Boiling Point	149-160°C (300-320°F)
Melting Point	101.5°C (215°F)
Sublimation Point	157 °C
Decomposition Temperature	189.5 °C
Solubility in water	14.3 g / 100 ml (25°C)
Solubility in Ethanol	23.7 g / 100 ml (15 °C)
Solubility in Diethyl Ether	1.37 g / 100 ml (15 °C)
Specific gravity (Water = 1)	1.90 g/cm^3 (anhydrous) 1.653 g/cm^3 (dihydrate)
Acidity	Strong Acid
Dissociation constant (pK_a)	pK_1 = 1.23, pK_2 = 4.19 (25 °C)
Crystal Structure	Rhombic (anhydrous), Monoclinic (dihydrate)

Section 10: Stability and Reactivity

Stability:	Stable under ordinary conditions of use and storage.
Incompatibilities:	Strong oxidizing agents (such as perchlorates, peroxides, permanganates, chlorates, nitrates, chlorine, bromine and fluorine); hypochlorite, Sliver and its compounds, strong alkalis, chlorites and furfuryl alcohol – since violent reactions occur.
Conditions to avoid:	Heat, ignition sources and incompatibilities.
Hazardous Decomposition Products:	Carbon monoxide, Carbon dioxide, formic acid, acrid smoke and fumes.
Hazardous Polymerisation:	Has not been reported.

Section 11: Toxilogical Information

CAS Number	RTECS Number
144-62-7	R02450000
6153-56-6	Unlisted

SKIN AND EYE IRRITATION DATA:

Route/Organism	Dose	Effect
Skin-Rabbit	500 mg/24 hour	Mild
Eye-Rabbit	250 µg/24 hour	Severe
Eye-Rabbit	100 mg/4S rinse	Severe

ACUTE TOXICITY DATA:

Route/Organism	Dose	Effect
Intraperitoneal-Mouse	lethal dose (50 percent kill): 270 mg/kg	N/R
Oral-Dog	lowest published lethal dose: 1 gm/kg	N/R
Oral-Rat	lethal dose (50 percent kill):7500mg/kg	N/R
		Gastrointestinal: Changes in structure or function of esophagus
Oral-Woman	lowest published lethal dose: 600 mg/kg	Gastrointestinal: Hypermotility, diarrhea
		Gastrointestinal: Other changes
Subcutaneous-Cat	lowest published lethal dose:112 mg/kg	N/R
Subscutaneous-Frog	lowest published lethal dose:757 mg/kg	N/R
Unreported route-Rat	lethal dose (50 percent kill):1400 mg/kg	N/R

Only selected data from Registry of Toxic Effects of Chemical Substances (RTECS #: RO2450000) is presented here. See actual entry for complete information.

CARCINOGENICITY:

Oxalic Acid, anhydrous	Not Listed by ACGIH, IARC, NIOSH, NTP or OSHA.
Oxalic Acid Dihydrate	Not Listed by ACGIH, IARC, NIOSH, NTP or OSHA.

Section 12: Ecological Information

Environmental Fate:

Biodegradation	Readily Biodegradable
BOD5	0.16 mg/l
COD	0.18 mg/l
BOD5/COD ratio	0.89
BCF	0.6
Bio-Accumulation	Non bio-accumulable

Ecotoxicity:

LC50	4000 mg/L, 24 hours, Fish (Bluegill), 1000 ppm, 0.5 hours, Fish (Gold Fish), 100 ppm, 0.3 hours, Fish (Trout) 5330 mg/L, 96 hours, Amphibian(Clawed Toad)
EC50	136.9 mg/L, 48 hours, Crustaceans(Water Flea) 1500 mg/L, 24 hours, Algae

Section 13: Disposal Considerations

Disposal should be done in accordance with local, state and federal regulations.

Section 14: Transport Information

	US DOT	IMO
Proper Shipping Name	Corrosive, Solid, Acidic, Organic N.O.S. (Oxalic Acid, Dihydrate)	Corrosive, Solid, Acidic, Organic N.O.S. (Oxalic Acid, Dihydrate)
UN Number	3261	3261
Hazard Class	8	8
Packing Group	III	III

Section 15: Regulatory Information

Classification and labeling information in accordance with EC directives

Classification	Xn; R21/22	
Hazard Symbol	 Xn: Harmful	
Risk Phrases	R21/22	Harmful in contact with skin and if swallowed
Safety Phrases	S2 S24/25	Keep out of reach of children Avoid contact with skin and eyes

Section 16: Other Information

References:

IUCLID Chemical Data Sheet - ESIS

Chemical Toxicity studies on Aquatic Organisms in PAN pesticides database

Chemical profiles created by Canadian centre for occupational health and safety

MSDS available on the internet

Legend:

CAS	Chemical Abstract Service
EINECS	European Inventory of Existing Commercial Chemical substance
NFPA	National Fire Protection Association (USA)
OSHA	Occupational Safety & Health Administration (USA)
NIOSH	National Institute for Occupational Safety & Health (USA)
IUCLID	International Uniform Chemical Information Database
ESIS	European chemical Substances Information System
ACIGH	American Conference of Governmental Industrial Hygienists
IARC	International Agency for Research on Cancer
RTECS	Registry of Toxic Effects of Chemical Substances
NTP	National Toxicology Program (USA)
PAN	Pesticide Action Network (USA)
US DOT	US Department of Transportation
IMO	International Maritime Organisation
TLV – TWA	Threshold Limit Value – Time Weighted Average (ACIGH)
TVL - STEL	Threshold Limit Value – Short Term Exposure Limit (ACIGH)
IDLH	Immediately Dangerous to life and health concentration value (NOISH)
LD50	Lethal Dosage causing death in 50%
LC50	Lethal concentration causing death in 50%
EC50	Median Effective Concentration (required to induce 50% effect)
BCF	Bio-concentration Factor

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