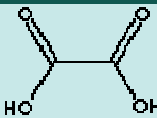


OXALIC ACID

PRODUCT IDENTIFICATION

CAS NO.	144-62-7 (Anhydrous), 6153-56-6 (Dihydrate)	
EINECS NO.	205-634-3	
FORMULA	HOOC-COOH · 2H ₂ O	
MOL WT.	126.07	
H.S. CODE	2917.11.0000	
TOXICITY	Oral rat LD50: 7500 mg/kg	
SYNONYMS	Ethanedioic acid, dihydrate; Oxaalzuur (Dutch); Oxalsäure (German); ácido oxálico (Spanish); Acide oxalique (French); Kyselina stavelova (Czech); Other RN: 216451-38-6, 63504-28-9, 97993-78-7	
SMILES	C(C(O)=O)(O)=O.O.O	
CLASSIFICATION	Dicarboxylic acid	
EXTRA NOTES		

PHYSICAL AND CHEMICAL PROPERTIES (DIHYDRATE)

PHYSICAL STATE	white crystals
MELTING POINT	101 - 102 C
BOILING POINT	149 - 160 C (sublimes)
SPECIFIC GRAVITY	1.6 - 1.7
SOLUBILITY IN WATER	1350 mg/l
SOLVENT SOLUBILITY	
pH	
VAPOR DENSITY	4.4
log Pow	-1.74 (Octanol-water)
OH RATE CONSTANT	1.04E-12 (cm ³ /molecule-sec at 25 C Atmospheric)
AUTOIGNITION	
REFRACTIVE INDEX	
NFPA RATINGS	Health: 3; Flammability: 1; Reactivity: 0
FLASH POINT	163 C
STABILITY	Stable under ordinary conditions

GENERAL DESCRIPTION

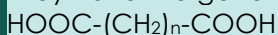
Oxalic acid is a chemical compound that has the simplest structure of all dicarboxylic acids. The salt of this ubiquitous acid is called oxalate (ethanedioate).

History of oxalic acid: Oxalic acid was first discovered in 1769 by the German pharmacist Johann Christian Wiegleb in the plant Oxalis (Oxalis acetosella, from which the name "oxalic acid" is derived). It was synthesized from inorganic compounds by the chemist Friedrich Wöhler in 1924.

DICARBOXYLIC ACIDS

Although the dicarboxylic acids do not occur in appreciable amounts as components of animal or vegetal lipids, they are in general important metabolic products of fatty acids since they originate from them by oxidation. Dicarboxylic acids are suitable substrates for preparation of organic acids for the pharmaceutical and food industries. Furthermore, they are useful materials for the preparation of fragrances, polyamides, adhesives, lubricants, and polyesters.

They have the general type formula



In vegetal, a great variety of molecular forms of dicarboxylic acids are found :

simple forms with a straight carbon chain or a branched chain

complex forms with a dicarboxylic acid and an alkyl side chain : alkylitaconates

1 - Simple forms of dicarboxylic acids

Short-chain dicarboxylic acids are of great importance in the general metabolism and up to $n=3$ they cannot be considered as lipids since their water solubility is important. The simplest of these intermediates is oxalic acid ($n=0$), the others are malonic ($n=1$), succinic ($n=2$) and glutaric ($n=3$) acids.

Local: Oxalic Acid (also called Ethanedioic Acid) is a colourless, crystalline, toxic organic compound belonging to the family of dicarboxylic acids; melting at 187 C; soluble in water, alcohol, and ether. It occurs in the form of its metal salts (usually calcium or potassium) in many plants. It is commercially manufactured by heating sodium formate in the presence of an alkali catalyst to form sodium oxalate, which should be converted to free oxalic acid when treated with sulfuric acid. It is also prepared by oxidizing carbohydrates with nitric acid, by heating saw dust with caustic alkalies or by fermentation of sugar solutions in the presence of certain molds. Oxalic acid is the only possible compound in which two carboxyl groups are joined directly; for this reason oxalic acid is one of the strongest acids in organic compounds. Unlike other carboxylic acids, oxalic acid (and formic acid) is readily oxidized and combine with calcium, iron, sodium, magnesium, or potassium to form less soluble salts called oxalates. Oxalic acid and oxalates are useful as reducing agents for photography, bleaching, and rust removal. They are widely used as an purifying agent in pharmaceutical industry, precipitating agent in rare-earth metal processing, bleaching agent in textile and wood industry, rust-remover for metal treatment, grinding agent, waste water treatment, acid rinse in laundries and removing scale from automobile radiators.

Applications: Purifying agent, Precipitating agent, Bleaching agent, Metal treatment, Grinding agent, Waste water treatment, Reducing agent

SALES SPECIFICATION

APPEARANCE	white crystals
TOTAL ACIDITY	99.5% min
ASH	0.1% max
IRON	0.02% max
LOSS ON IGNITION	0.08% max
SULFATE	0.1% max
CHLORIDE	20ppm max
HEAVY METAL	10ppm max

TRANSPORTATION

PACKING	25kgs in bag
HAZARD CLASS	8 (Packing Group: II)
UN NO.	1759

OTHER INFORMATION

Hazard Symbols: XN, Risk Phrases: 21/22, Safety Phrases: 24/25

GENERAL DESCRIPTION OF DICARBOXYLIC ACID

Dicarboxylic acid is a compound containing two carboxylic acid, $-\text{COOH}$, groups. Straight chain examples are shown in table. The general formula is $\text{HOOC}(\text{CH}_2)_n\text{COOH}$, where oxalic acid's n is 0, $n=1$ for malonic acid, $n=2$ for succinic acid, $n=3$ for glutaric acid, and etc. In substitutive nomenclature, their names are formed by adding '-dioic' as a suffix to the name of the parent compound. They can yield two kinds of salts, as they contain two carboxyl groups in its molecules. The range of carbon chain lengths is from 2, but the longer than C 24 is very rare. The term long chain refers to C 12 up to C 24 commonly. Carboxylic acids have industrial application directly or

indirectly through acid halides, esters, salts, and anhydride forms, polymerization, and etc. Dicarboxylic acids can yield two kinds of salts or esters, as they contain two carboxyl groups in one molecule. It is useful in a variety of industrial applications include;

- Plasticizer for polymers
- Biodegradable solvents and lubricants
- Engineering plastics
- Epoxy curing agent
- Adhesive and powder coating
- Corrosion inhibitor
- Perfumery and pharmaceutical
- Electrolyte

There are almost infinite esters obtained from carboxylic acids. Esters are formed by removal of water from an acid and an alcohol. Carboxylic acid esters are used as in a variety of direct and indirect applications. Lower chain esters are used as flavouring base materials, plasticizers, solvent carriers and coupling agents. Higher chain compounds are used as components in metalworking fluids, surfactants, lubricants, detergents, oiling agents, emulsifiers, wetting agents textile treatments and emollients. They are also used as intermediates for the manufacture of a variety of target compounds. The almost infinite esters provide a wide range of viscosity, specific gravity, vapor pressure, boiling point, and other physical and chemical properties for the proper application selections.