FORMIC ACID

PRODUCT IDENTIFICATION	
CAS NO.	64-18-6
EINECS NO.	200-579-1
FORMULA	HCOOH
MOL WT.	46.03
H.S. CODE	2915.11
TOXICITY	Oral rat LD50: 1100mg/kg
SYNONYMS	Hydrogencarboxylic acid; aminic acid; formylic acid; Methanoic acid; Acide Formique (French); Acido Formico (Italian); Ameisensaeure (German); Kwas Metaniowy (Polish); Kyselina Mravenci (Czech); Ameisensäure; Mierenzuur (Dutch); ácido fórmico (Spanish); Acide Formique (French);
DERIVATION	Methylformate, Condensed water
CLASSIFICATION	

DESCRIPTION OF FORMIC ACID

Formic acid, also called methanoic acid), is the simplest and has the lowest mole weight of the carboxylic acids, in which a single hydrogen atom is attached to the carboxyl group (HCOOH). If a methyl group is attached to the carboxyl group, the compound is acetic acid. It occurs naturally in the body of ants and in the stingers of bees. Functionally, it is not only an acid but also an aldehyde; it reacts with alcohols to form esters as an acid and it is easily oxidized which imparts some of the character of an aldehyde. Pure formic acid is a colorless, toxic, corrosive and fuming liquid, freezing at 8.4 C and boiling at 100.7 C. It is soluble in water, ether, and alcohol. It irritates the mucous membranes and blisters the skin. It is prepared commercially from sodium formate with the reaction of condensed sulfuric acid. Formic acid is used as a chemical intermediate and solvent, and as a disinfectant. It is also in processing textiles and leathers, electroplating and coagulating latex rubber.

PHYSICAL AND CHEMICAL PROPERTIES	
PHYSICAL STATE	colorless liquid with a pungent odor
MELTING POINT	8.3 C
BOILING POINT	100.7 C
SPECIFIC GRAVITY	1.21
SOLUBILITY IN WATER	miscible
pH	
VAPOR DENSITY	1.6
AUTOIGNITION	
REFRACTIVE INDEX	
NFPA RATINGS	Health: 2; Flammability: 2; Reactivity: 1
FLASH POINT	69 C
STABILITY	Stable under ordinary conditions

APPLICATIONS

It is used for decalcifier; reducer in dyeing for wool fast colours; dehairing and plumping hides; tanning; electroplating; coagulating rubber latex; silage and grain preservation; aidditive in regenerating old rubber; solvents of perfume; lacquers; alkylating agent for alcohols; carboxylating agent for tertiary compounds. It is also used as an intermediate for the production of a wide variety of products in the chemicals and pharmaceutical industries.

SALES SPECIFICATION	
APPEARANCE	colorless liquid with a pungent odor
FORMIC ACID	85.0% min
COLOR, APHA	10 max
CHLORIDE (Cl)	5ppm max

NONVOLATILES	50ppm max
Fe	5ppm max
TRANSPORTATION	
PACKING	240kgs in drum, 20mts in Iso-Tank
HAZARD CLASS	8 (Packing group: II)
UN NO.	1779

GENERAL DESCRIPTION OF CARBOXYLIC ACID

Carboxylic acid is an organic compound whose molecules contain carboxyl group and have the condensed chemical formula R-C(=O)-OH in which a carbon atom is bonded to an oxygen atom by a double bond and to a hydroxyl group by a single bond), where R is a hydrogen atom, an alkyl group, or an aryl group. Carboxylic acids can be synthesized if aldehyde is oxidized. Aldehyde can be obtained by oxidation of primary alcohol. Accordingly, carboxylic acid can be obtained by complete oxidation of primary alcohol. A variety of Carboxylic acids are abundant in nature and many carboxylic acids have their own trivial names. Examples are shown in table. In substitutive nomenclature, their names are formed by adding -oic acid' as the suffix to the name of the parent compound. The first character of carboxylic acid is acidity due to dissociation into H^+ cations and $RCOO^-$ anions in aqueous solution. The two oxygen atoms are electronegatively charged and the hydrogen of a carboxyl group can be easily removed. The presence of electronegative groups next to the carboxylic group increases the acidity. For example, trichloroacetic acid is a stronger acid than acetic acid. Carboxylic acid is useful as a parent material to prepare many chemical derivatives due to the weak acidity of the hydroxyl hydrogen or due to the difference in electronegativity between carbon and oxygen. The easy dissociation of the hydroxyl oxygen-hydrogen provide reactions to form an ester with an alcohol and to form a water-soluble salt with an alkali. Almost infinite esters are formed through condensation reaction called esterification between carboxylic acid and alcohol, which produces water. The second reaction theory is the addition of electrons to the electron-deficient carbon atom of the carboxyl group. One more theory is decarboxylation (removal of carbon dioxide form carboxyl group). Carboxylic acids are used to synthesize acyl halides and acid anhydrides which are generally not target compounds. They are used as intermediates for the synthesis esters and amides, important derivatives from carboxylic acid in biochemistry as well as in industrial fields. 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. Amides are formed from the reaction of a carboxylic acids with an amine. Carboxylic acid's reaction to link amino acids is wide in nature to form proteins (amide), the principal constituents of the protoplasm of all cells. Polyamide is a polymer containing repeated amide groups such as various kinds of nylon and polyacrylamides. Carboxylic acid are in our lives.

ALIPHATIC CARBOXYLIC ACIDS

COMMON NAME	SYSTEMATIC NAME	CAS RN	FORMULA	MELTING POINT
Formic Acid	Methanoic acid	64-18-6	HCOOH	8.5 C
Acetic Acid	Ethanoic acid	64-19-7	CH_3COOH	16.5 C
Carboxyethane	Propionic Acid	79-09-4	CH_3CH_2COOH	-21.5 C
Butyric Acid	n-Butanoic acid	107-92-6	$CH_3(CH_2)_2COOH$	-8 C
Valeric Acid	n-Pentanoic Acid	109-52-4	$CH_3(CH_2)_3COOH$	-19 C
Caproic Acid	n-Hexanoic Acid	142-62-1	$CH_3(CH_2)_4COOH$	-3 C

Enanthoic Acid	n-Heptanoic acid	111-14-8	$CH_3(CH_2)_5COOH$	-10.5 C
Caprylic Acid	n-Octanoic Acid	124-07-2	$CH_3(CH_2)_6COOH$	16 C
alpha-Ethylcaproic Acid	2-Ethylhexanoic Acid	149-57-5	$CH_3(CH_2)_3CH(C_2H_5)COOH$	-59 C
Valproic Acid	2-Propylpentanoic Acid	99-66-1	$(CH_3CH_2CH_2)_2CHCOOH$	120 C
Pelargonic Acid	n-Nonanoic Acid	112-05-0	$CH_3(CH_2)_7COOH$	48 C
Capric Acid	n-Decanoic Acid	334-48-5	$CH_3(CH_2)_8COOH$	31 C