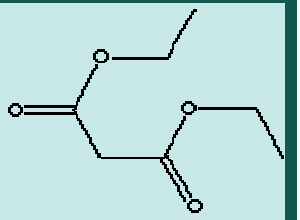
DIETHYL MALONATE



PRODUCT IDENTIFICATION

CAS NO.	105-53-3
EINECS NO.	203-305-9
FORMULA	$CH_2(COOC_2H_5)_2$
MOL WT.	160.17
H.S. CODE	
TOXICITY	
SYNONYMS	Ethyl methane dicarboxylate; Ethyl propanedioate; Diethylmalonat (German); Malonato de dietilo (Spanish); Malonate de diéthyle (French); Ethyl malonate; Malonic; Propanedioic acid diethyl ester;
DERIVATION	
CLASSIFICATION	

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	clear liquid
MELTING POINT	-50 C
BOILING POINT	199 C
SPECIFIC GRAVITY	1.055
SOLUBILITY IN WATER	Slightly soluble
pH	
VAPOR DENSITY	5.5
AUTOIGNITION	
NFPA RATINGS	Health: 0; Flammability: 1; Reactivity: 0
REFRACTIVE INDEX	1.4135
FLASH POINT	93 C
STABILITY	Stable under ordinary conditions

GENERAL DESCRIPTION & APPLICATIONS

Malonic acid (also called Propanedioic Acid) is a white crystalline C-3 dicarboxylic acid; melting at 135 -136 C; readily soluble in water, alcohol and ether; solution in water is medium-strong acidic. It can be derived by oxidizing malic acid or by the hydrolysis of cyanacetic acid. Malonic acid itself is rather unstable and has few applications. It's diethyl ester (diethyl malonate) is more important commercially. Diethyl malonate, a colourless, fragrant liquid boiling at 199 C, is prepared by the reaction of monochloroacetatic acid with methanol, carbon monoxide or by the reaction cyanoacetic acid (the half nitriled-malonic acid) with ethyl alcohol. Malonic acid and its esters contain active methylene groups which have relatively acidic alpha-protons due to H atoms adjacent to two carbonyl groups. The reactivity of its methylene group provide the sequence of reactions of alkylation, hydrolysis of the esters and decarboxylation resulting in substituted ketones. The methylene groups in 1,3-dicarboxylic acid utilize the synthesis of barbiturates; a hydrogen atom is removed by sodium ethoxide, and the derivative reacts with an alkyl halide to form a diethyl alkylmalonate. The diethyl dialkylmalonates are converted to barbiturates by reaction with urea. Malonic acid and its esters are characterized by the large number of condensation products. They are important intermediates in syntheses of vitamins B1 and B6, barbiturates, non-steroidal anti-inflammatory agents, other numerous pharmaceuticals, agrochemicals and flavors & fragrances compounds.

SALES SPECIFICATION

APPEARANCE	clear liquid
PURITY	99.0% min
MOISTURE	0.1% max

ACIDITY	0.1% max

TRANSPORTATION

PACKING	200kgs in drum
HAZARD CLASS	
UN NO.	

GENERAL DESCRIPTION OF DICARBOXYLIC ACID

Dicarboxylic acid is a compound containing two carboxylic acid, -COOH, groups. Straight chain examples are shown in table. The general formula is $HOOC(CH_2)_nCOOH$, 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.

C length (Straight)	Product	CAS #	Melting Point	Boiling Point
C 2	Oxalic Acid (Ethanedioic Acid)	144-62-7	189 - 191 C	Sublimes
C 3	Malonic Acid (Propanedioic Acid)	141-82-2	131 - 135 C	Decomposes
C 4	Succinic Acid (Butanedioic Acid)	110-15-6	185 - 190 C	235 C
C 5	Glutaric Acid (Pentanedioic Acid)	110-94-1	95 - 99 C	302 C
C 6	Adipic Acid (Hexanedioic Acid)	124-04-9	151 - 153 C	265 C at 100 mmHg
C 7	Pimelic Acid (Heptanedioic Acid)	111-16-0	105 - 106 C	212 C at 10 mmHg
C 8	Suberic Acid	505-48-6	143 - 144 C	230 C at 15 mmHg

		(Octanedioic Acid)			
	C 9	Azelaic Acid (Nonanedioic Acid)	123-99-9	100 - 103 C	237 C at 15 mmHg
	C 10	Sebacic Acid (Decanedioic Acid)	111-20-6	131 - 134 C	294 at 100 mmHg
	C 11	Undecanedioic acid	1852-04-6	109 - 110 C	
	C 12	Dodecanedioic acid	693-23-2	128 - 129 C	245 C at 10 mmHg
	C 13	Brassylic acid (Tridecanedioic acid)	505-52-2	112 - 114 C	
	C 14	Tetradecanedioic acid	821-38-5	126 - 128 C	
	C 15	Pentadecanedioic acid	1460-18-0		
	C 16	Thapsic acid (Hexadecanedioic acid)	505-54-4	124 - 126 C	
	C 18	Octadecanedioic acid	871-70-5		