SHIVALIK RASAYAN LIMITED

MALATHION TECHNICAL

Malathion is a non-systemic, wide spectrum organophosphorous (OP) based contact insecticide. It is used in the agricultural production of a wide variety of food/feed crops. It controls insects such as aphids, leafhoppers, Japanese beetles, spider mites, scale insects, housefly & mosquitos as well as large number of other sucking and chewing insects attacking fruits, vegetables, ornamentals & stored products, mosquito control in Public Health Programs.

Malathion is formulated as a technical (91-95% ai), a dust (1-10% ai), and emulsifiable concentrate (3-82% ai), a ready-to-use (1.5-95% ai), a pressurized liquid (0.5-3% ai), and a wettable powder (6-50% ai) Several of the 95% liquids are intended for ultra-low-volume (ULV) applications. Malathion can be applied using ground or aerial equipment, thermal and non-thermal forger, ground boom, airblast sprayer, chemigation, and a variety of hand-held equipment such as backpack sprayers, low-pressure handwands, hose-end sprayers and power dusters. Multiple foliar application may be made, as needed depending in pest presence.

Malathion is an OP insecticide, and like all members of this class, the mode of toxic action is the inhibition of cholinesterase (ChE). The selective toxicity of Malathion has been well documented. Malathion is metabolically converted to its structurally similar metabolite, malaoxon (oxidation of the P=S moiety to P=O), in insects and mammals. Mammalian systems show greater carboxyesterase activity, as compared with insects, so that the toxic agent malaoxon builds up more in insects that it mammals. This accounts for the selective toxicity of Malathion towards insects.

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General Information

PHYSICAL-CHEMICAL PROPERTIES:			
1.	Common Name	:	Malathion
2.	Chemical Name	:	Diethyl (dimethoxy thiophosphoryl thio) succinate
3.	Empirical Formula	:	$C_{10}H_{19}O_6PS_2$
4.	Structural Formula	:	S II $(CH_3O)_2PSCHCH_2CO_2CH_2CH_3$ I $CO_2CH_2CH_3$
5.	Molecular Weight	:	330.38
6.	Appearance & Physical Form	:	Amber to yellowish liquid
7.	Vapour Pressure	:	5.3 mPa at 30°C
8.	Density	:	1.22 to 1.23 at 20°C
9.	Boiling Point	:	156-157°C at 0.7 mm Hg
10.	Solubility	:	In water 145 ppm (25°C) miscible with most organic solvent, e.g. acetone, ethers, chloroform and alcohols
11.	Inflammability	:	Non-inflammable
12.	Stability	:	Hydrolyzed by aqueous acids and alkalis, DT_{50}4 d (pH8), 147d (pH6) slowly oxidized by air, soil and water
13.	Storage Stability	:	Min. 2 years in normal conditions of storage in sealed containers

SPECIFICATIONS:			
1.	Content of active ingredient by GLC	:	95% w/w min.
2.	Material insoluble in acetone	:	0.5% w/w max.
3.	Acidity (As H2SO4 present by mass)	:	0.4% w/w max.
4.	Moisture content	:	0.1% w/w max.
5.	Specific Gravity at 25/25oC	:	1.23% w/w min.

METHOD OF ANALYSIS:
By GLC or Spectrophotometry

PACKING:
Packed in properly lacquered mild steel drums 250 kg.

TOXICITY:		
Acute Oral	:	LD_{50} for rats 1400 mg/kg/ mice 920 mg/kg.
Acute Dermal	:	LD_{50} rats 2330 mg/kg. Rabbits 4100mg/kg.
Inhalation	:	LC_{50} (4h) for rats 84 mg/m3
NOEL (2y)	:	For rats 10 mg/kg. diet
ADI	:	0.02 mg/kg b.w.
Toxicity Class	:	WHO, III, EPA III

USES:
Malathion is a non-systemic acaricide and insecticide with contact action. It is effective against aphids, spider mites, scale insects, housefly & Mosquitos as well as large number of other sucking & chewing insects attacking fruits, vegetables, ornamentals & stored products, Adults mosquito control in Public Health programs INSECTICIDE FOR NON-AGRICULTURAL USES-e.g., Aquatic uses, Livestock, Poultry, Home & Garden uses, Lawns, Turf & Ornamentals, Commercial, Household & Industrial Uses, COTTON, VEGETABLES & CITRUS, OTHER FIELD CROPS e.g., Corn & Sorghum, Deciduous Fruits/Nuts, Citrus, Wheat, Storage, Bins & Transportation Equipment and Acaricide, Insecticide to control fruit flies. It is effective against organochlorine resistant species.