

3. CHEMICAL AND PHYSICAL INFORMATION

3.1 CHEMICAL IDENTITY

Information regarding the chemical identity of disulfoton is located in Table 3-1.

3.2 PHYSICAL AND CHEMICAL PROPERTIES

Disulfoton is a systemic insecticide/acaricide that belongs to the organophosphate class of pesticides. Pure disulfoton is a colorless oil with low volatility and water solubility, but is readily soluble in most organic solvents (Worthing 1987). Information regarding the physical and chemical properties of disulfoton is located in Table 3-2.

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TABLE 3-1. Chemical Identity of Disulfoton

Characteristic	Information	Reference
Chemical name	O, O-Diethyl S-[2-(ethylthio)ethyl]-phosphorodithioate	Worthing 1987
Synonym(s)	Ethylthiodemeton; M-74; thiodemeton	Worthing 1987
Registered trade name(s)	Di-Syston; Dithiosystox; Solvirex ENT 23347; Frumin AL	Worthing 1987 Merck 1989
Chemical formula	$C_8H_{19}O_2PS_3$	Worthing 1987
Chemical structure	$CH_3CH_2SCH_2CH_2\overset{\overset{S}{ }}{S}P(OCH_2CH_3)_2$	Worthing 1987
Identification numbers:		
CAS Registry	298-04-4	Sittig 1985
NIOSH RTECS	TD9275000	Sittig 1985
EPA hazardous waste	PO39	HSDB 1994
OHM/TADS	7800012	HSDB 1994
DOT/UN/NA/IMCO shipping	NA2783/IMO 6.1	HSDB 1994
HSDB	379	HSDB 1994
NCI	No data	HSDB 1994

CAS = Chemical Abstracts Services; DOT/UN/NA/IMCO = Department of Transportation/United Nations/ North America/International Maritime Dangerous Goods Code; EPA = Environmental Protection Agency; HSDB = Hazardous Substance Data Bank from National Library of Medicine; NCI = National Cancer Institute; NIOSH = National Institute for Occupational Safety and Health; OHM-TADS = Oil and Hazardous Materials/Technical Assistance Data System; RTECS = Registry of Toxic Effects of Chemical Substances

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TABLE 3-2. Physical and Chemical Properties of Disulfoton

Property	Information	Reference
Molecular weight	274.38	HSDB 1994
Color	Colorless (pure); yellow (technical)	Sanborn et al. 1977
Physical state	Oily liquid	HSDB 1994
Melting point	No data	
Boiling point	113 °C at 0.4 mm Hg; 62 °C at 0.01 mm Hg	Melnikov 1971; Sanborn et al. 1977
Density:		
at 20 °C	1.144 g/cm ³	Worthing 1987
at 25 °C	No data	
at 30 °C	No data	
Odor	Aromatic (technical product)	HSDB 1994
Odor threshold:		
Water	No data	
Air	No data	
Solubility:		
Water at 20 °C	25 mg/L; 15.2 mg/L	Sanborn et al. 1977; Lord and Burt 1964
Organic solvent(s)	Readily soluble in most	Sanborn et al. 1977
Partition coefficients:		
Log K _{ow}	4.02	Bowman and Sans 1983
Log K _{oc}	3.2; 2.78	Rao and Davidson 1982; Wauchope et al. 1992
Vapor pressure at 20 °C	1.8x10 ⁻⁴ mm Hg	Melnikov 1971
Henry's law constant:		
at 20 °C	2.17x10 ⁻⁶ atm-m ³ /mol	Domine et al. 1992
at 30 °C	No data	
Autoignition temperature	No data	
Flashpoint	>180 °F (TOC)	EPA 1984b
Flammability limits	No data	
Conversion factors	1 mg/m ³ = 0.089 ppm (air at 25 °C)	EPA 1990b
Explosive limits	No data	

EPA = Environmental Protection Agency; HSDB = Hazardous Substance Data Bank from National Library of Medicine; TOC = Tag open cup

