

## CHAPTER 4. CHEMICAL AND PHYSICAL INFORMATION

### 4.1 CHEMICAL IDENTITY

Disulfoton is a systemic insecticide/acaricide that belongs to the organophosphate class of pesticides.

Disulfoton does not occur naturally. Table 4-1 lists common synonyms, trade names, and other pertinent identification information for disulfoton.

**Table 4-1. Chemical Identity of Disulfoton**

Characteristic	Information	Reference
Chemical name	Disulfoton	NLM 2021
Synonym(s) and Registered trade name(s)	o,o-Diethyl s-(2-eththioethyl) phosphorodithioate; Ethylthiodemeton; M-74; thiodemeton; Di-Syston; Dithiosystox; Solvirex; ENT 23347; Frumin AL	NLM 2021
Chemical formula	C <sub>8</sub> H <sub>19</sub> O <sub>2</sub> PS <sub>3</sub>	Lide 2005
Chemical structure		NLM 2021
CAS registry number	298-04-4	Lide 2005
EPA hazardous waste	P039	EPA 2019a

CAS = Chemical Abstracts Service; EPA = Environmental Protection Agency; NLM = National Library of Medicine; UNII = Unique Ingredient Identifier

### 4.2 PHYSICAL AND CHEMICAL PROPERTIES

Pure disulfoton is a colorless oil with low volatility and water solubility, but is readily soluble in most organic solvents and fatty oils (Bowman and Sans 1983; EPA 1978). The half-life of disulfoton suggests that it is short-lived in the atmosphere. Table 4-2 lists important physical and chemical properties of disulfoton.

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**Table 4-2. Physical and Chemical Properties of Disulfoton**

Property	Information	Reference
Molecular weight	274.405 g/mol	Lide 2005
Color	Colorless to yellow	Sanborn et al. 1977
Physical state	Liquid	Muir et al. 2004
Melting point(s)	-25.0°C	Lide 2005
Boiling point(s)	108°C at 0.01 mm Hg 128°C at 1.0 mm Hg	Lide 2005
Density: at 20°C	1.144 g/cm <sup>3</sup>	Lide 2005
Odor	Sulfur	NLM 2021
Odor threshold:		NLM 2021
Water	No data	
Air	No data	
Solubility:		
Water at 20°C	25 mg/L	NLM 2021
Organic solvent(s)	Readily soluble in most	EPA 1978
Partition coefficients:		
Log K <sub>ow</sub>	4.02	NIOSH 2017
Log K <sub>oc</sub>	3.2–3.3	Wauchope et al. 2002
Vapor pressure at 25°C	9.75x10 <sup>-5</sup> mm Hg	NLM 2021
Henry's law constant at 25°C	2.2x10 <sup>-6</sup> atm-m <sup>3</sup> /mol	NLM 2021
Degradation half-life in air via reaction with OH radicals	≈3 hours	Meylan and Howard 1993
Dissociation constant	No data	NLM 2021
Heat of vaporization	76.7 kJ/mol at 25°C	NIST 2018
Autoignition temperature	No data	NLM 2021
Flashpoint	>180°F (>82°C)	NIOSH 2018
Flammability limits in air	No data	NIOSH 2018
Conversion factors	1 ppm=11.22 mg/m <sup>3</sup> 1 mg/m <sup>3</sup> =0.089 ppm	ACGIH 2002