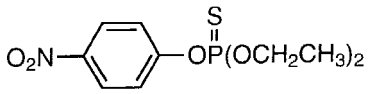
NOME COMUNE: PARATHION

FORMULA DI STRUTTURA:



Classe chimica: fosforganici-tionofosfati
N.ro CAS [56-38-2]

USO: insetticida a vasto spettro d'azione che trova impiego in frutticoltura, olivicoltura, ortofloricoltura ecc.
DOSE MASSIMA DI IMPIEGO (g p.a./ha): 4000 (Muccinelli, 1993)

PROPRIETA' FISICO-CHIMICHE

Peso molecolare: 291,27

Solubilità in acqua (mg/L) (25°C):

11	(20°C, Worthing, 1991; Tomlin, 1994);
11,9	(20°C, NIEHS, 1975; Freed *et al.*, 1977; 20°C, O'Brien, 1974; Suntio *et al.*, 1988; Schomburg *et al.*, 1991);
12	(20°C, Siebers & Mattusch, 1996);
12,4	(20°C, Bowman & Sans, 1979; Fuhremann & Lichtenstein, 1980; Sharom *et al.*, 1980; Shiu *et al.*, 1990; Patil, 1994);
12,9, 15,2	(20°C, 30°C, Montgomery, 1993);
14	(Gerstl & Mingelgrin, 1984; Shiu *et al.*, 1990);
15	(20°C, Suntio *et al.*, 1988; Findinger *et al.*, 1990; Majewski & Capel, 1995);
18-31	(Robeck *et al.*, 1965);
20	(Burkhard & Guth, 1981; Merck Index, 1983; Somasundaram *et al.*, 1991);
24	(20°C, Hornsby *et al.*, 1996; Agrochemicals Handbook, 1987; Isnard & Lambert, 1988; Bruggeman *et al.*, 1981; Adams 1987; Gunther *et al.*, 1968; Melnikov, 1971; Bowman & Sans, 1979; Worthing, 1987; Taylor & Glofelty, 1988; Suntio *et al.*, 1988; Shiu *et al.*, 1990; Halfon *et al.*, 1996; Jury *et al.*, 1983; Macy, 1948; Chiou *et al.*, 1977; Martin & Worthing, 1977; Kenaga, 1980; Karickhoff, 1981; Jury *et al.*, 1983; Kim *et al.*, 1984; Milne, 1995; Pait *et al.*, 1992; USEPA, 1984; McLean *et al.* 1988; Wauchope, 1978; Khan, 1980; Lyman, 1982; Willis & McDowell, 1982);
24, 6	(Briggs, 1981);
6,37, 7,5	(Kühne *et al.*, 1995);
6,54	(Felsot & Dahm, 1979; Shiu *et al.*, 1990; Howard, 1991);

Tensione di vapore (Pa) (25°C):

$1{,}26E^{-03}$	(Spencer *et al.*, 1979; Jury *et al.*, 1983; Taylor & Glotfelty, 1988; Taylor & Spencer, 1990);
$1{,}29E^{-03}$	(Spencer, 1983; Howard, 1991);
$1{,}30E^{-03}$	(25,3°C, Kim *et al.*, 1984; 20°C, Siebers & Mattusch, 1996; Taylor & Spencer; 1990);

12,3E^{-03}	(30°C, Bright *et al.*, 1950; Spencer *et al.*, 1973);
5,04E^{-03}	(20°C, Bright *et al.*, 1950; Freed *et al.*, 1977; Khan, 1980; Spencer, 1982; Suntio *et al.*, 1988);
5,05E^{-03}	(Burkhard & Guth, 1981);
5,07E^{-03}	(20°C, Spencer, 1973; Fuhremann & Lichtenstein, 1980);
5,0E^{-03}	(20°C, USEPA, 1984;, McLean *et al.*, 1988; 20°C, Agrochemicals Handbook, 1987; Halfon *et al.*, 1996; 20°C, Montgomery, 1993);
5,85E^{-04}	(20°C, Gückel *et al.*, 1973; Suntio *et al.*, 1988);
6,0E^{-04}	(20°C, Suntio *et al.*, 1988; Findinger *et al.*, 1990; Majewski Capel, 1995);
6,3E^{-04}	(20°C, Spencer *et al.*, 1979; Kim *et al.*, 1984; Suntio *et al.*, 1988);
6,67E^{-04}	(20°C, Hornsby *et al.*, 1996);
6,9 E^{-04}	(20°C, Kim, 1985; Suntio *et al.*, 1988);
7,6 E^{-04}	(20°C, Gückel *et al.*, 1973; Suntio *et al.*, 1988; 20°C, Wolfdietrich, 1965; Kim *et al.*, 1984);
8,1E^{-04}	(20°C, Kim, 1985);
8,9E^{-04}	(20°C, Worthing, 1991; Tomlin, 1994);

Coefficiente di ripartizione n-ottanolo/acqua (log Kow):

2,15-3,93	(Montgomery, 1993);
2,609	(calc., Karcher & Devillers, 1990);
2,98	(Yoshioka *et al.*, 1986);
3,40	(Felsot & Dahm, 1979; Bowman & Sans, 1983b; Gerstl & Mingelgrin, 1984; Suntio *et al.*, 1988; Dao *et al.*, 1983);
3,45, 3,47, 3,81	(Finizio *et al.*, 1997);
3,47	(Kollig, 1993);
3,76	(Bowman & Sans, 1983b; Suntio *et al.*, 1988; De Bruijn & Hermens, 1991; Somasundaram *et al.*, 1991);
3,80	(Hansch & Leo, 1979; Isnard & Lambert, 1988; Fisher *et al.*, 1993; Suntio *et al.*, 1988; Bintein & Devillers, 1994);
3,81	(20°C, NIEHS, 1975; Freed *et al.*, 1977; Rao & Davidson, 1980; Kim *et al.*, 1984; Chiou *et al.*, 1977; Karickhoff, 1981; Lyman, 1982; Bowman & Sans, 1983b; Suntio *et al.*, 1988; De Bruijn & Hermens, 1991; Freed *et al.*, 1979; USEPA, 1984; McLean *et al.*, 1988);
3,83	(Hansch & Leo, 1985; Howard, 1991; Hansch *et al.*, 1995; Magee, 1991; Tomlin, 1994);
3,90	(Gerstl & Helling, 1987);
3,93	(Briggs, 1981; Bowman & Sans, 1983b; Suntio *et al.*, 1988; Thor, 1989; Connell & Markwell, 1990);

Coefficiente di ripartizione su carbonio organico (log Koc):

2,50-4,20	(Montgomery, 1993);
2,58, 3,52	(Gerstl & Helling, 1987);
2,83, 3,19	(Gerstl & Mingelgrin, 1984; Howard, 1991);
2,88	(calc., Kenaga, 1980);
2,90	(calc., Mill *et al.*, 1980; Adams, 1987);
3,04	(calc., Jury *et al.*, 1987a; Jury & Ghodrati, 1989);
3,15	(Kollig, 1993);
3,30	(Chiou *et al.*, 1979; Howard, 1991);
3,68	(Swohoda & Thomas, 1968; Kenaga, 1980; Karickhoff, 1981);
3,70	(20°C, Hornsby *et al.*, 1996);
4,02	(Hamaker & Thompson, 1972; Howard, 1991);

4,03 (Rao & Davidson, 1980; Karickhoff, 1981; Lyman, 1982; Jury *et al.*, 1983);

Costante di Henry (Pa m^3/mol):
1,2E^{-01} (20°C, calc., Mackay & Shiu, 1981; Suntio *et al.*, 1988);
1,2E^{-02} (20°C, calc., Suntio *et al.*, 1988; Fisher *et al.*, 1993; Majewski & Capel, 1995);
1,5E^{-02} (calc, Jury *et al.*, 1984; Jury & Ghodrati, 1989; calc., Taylor & Glotfelty, 1988);
2,0E^{-02} (Siebers & Mattusch, 1996);
5,7E^{-02} (calc., Howard, 1991);
8,7E^{-03} (23°C, Findinger & Glotfelty, 1990; Findinger *et al.*, 1990; Schomburg *et al.*, 1991; Montgomery, 1993);
9,6E^{-02} (24°C, calc., Chiou *et al.*, 1980);

Tempo di dimezzamento nel suolo (giorni):
da 6 (Pait *et al.*, 1992) a 24 (Sattar, 1990).

DISTRIBUZIONE AMBIENTALE:
Il modello di Mackay (livello I) suggerisce la seguente distribuzione (moli) nei comparti ambientali:

COMPARTO	**% di Distribuzione**
Aria	0,10
Acqua	39,64
Suolo	30,43
Sedimenti	28,40
Solidi sospesi	0,05
Biomassa acquatica	0,01
Biomassa vegetale	1,37
Somma delle moli introdotte	**100**

PARAMETRI TOSSICOLOGICI:
Alghe EC50 (mg/L):
7,86 (24h, *C. fusca*, inib. ripr., Faust *et al.*, 1993);
5,0E^{-01} (*S. subspicatus*, Tomlin, 1997);

Daphnia LC50 (mg/L)
6,0E^{-04} (48h, *D. pulex*, Verschueren, 1996);
8,0E^{-04}(26h, Frear & Boyd, 1967);
1,8E^{-03}-1,28E^{-02} (RIVM, 1994);
2,0E^{-03} (48h, Kühn *et al.*, 1989, cfr. Fernandez-Casalderrey *et al.*, 1995);
2,21E^{-03} (Vighi *et al.*, 1991);
2,5E^{-03} (48h, Tomlin, 1997);

Pesci LC50 (mg/L)
7,1E^{-01}-1,6 (RIVM, 1994);
1,5, 5,8E^{-01} (96h, r. trout, g. orfe, Tomlin, 1997);
1,41, 6,5E^{-01}, (*Pimephales promelas*, *Lepomis macrochirus*, Verschueren, 1996);
1,6, 1,8, 2,7, 3,0E^{-01}, 2,0E^{-02} (trout, goldfish, catfish, mosquito fish, Johnson & Finley, 1980);

Api LD50 (µg/ape)
$6{,}2E^{-02}$ (orale, Vighi *et al.*,1991);
$9{,}0E^{-02}$-$1{,}6E^{-01}$ (orale, Murray, 1985);
$4{,}0E^{-02}$ (contatto, RIVM 1994);
$7{,}0E^{-02}$-$1{,}0E^{-01}$ (Murray, 1985);
$1{,}1E^{-01}$ (Tomlin, 1997);

Lombrichi LC50 (14d, mg/Kg suolo su *E. foetida* o *E. andrei* se non altrimenti specificato)
64 (Hogger & Ammon, 1994);
>180 (Van Gestel *et al.*, 1992);
267 (Tomlin, 1997);
Lombrichi NOEC (mg/Kg suolo)
<10, 56 (crescita, prod.bozzoli, Van Gestel *et al.*, 1992);

Uccelli LD50 (mg/kg peso corporeo)
2,1 (RIVM, 1994);
5,95, 2,34, 6 (J. quail, m. ducks, b. quail, Smith, 1987);
6, 3, 2,1 (b. quail, pigeons, ducks, Johnson & Finley, 1980);
Uccelli LC50 (mg/kg dieta)
194 (RIVM, 1994);
238, 76-275, 194 (J. quail, m. ducks, b. quail, Smith, 1987);

Mammiferi LD50 orale (mg/kg)
13, 3,6 (ratto maschio, ratto femmina, Smith, 1987);
2, 12, 10 (ratto, topo, guinea pigs, Tomlin, 1997);
3,6-13 (WHO, 1975);
Mammiferi LD50 dermale (mg/kg)
71-76 (ratto, Tomlin, 1997);
6,8-21 (WHO, 1975);
Mammiferi LC50 inalazione (mg/l aria)
$3{,}0E^{-02}$ (4h, ratto, aerosol, Tomlin, 1997);
Mammiferi NOEL (dieta)
2 (2y, ratto, mg/Kg dieta, Tomlin, 1997;
<60 (18m, topo, mg/kg dieta, Tomlin, 1997);
$<1{,}0E^{-02}$ (1y, cane, mg/kg peso corporeo giorno, Tomlin, 1997);