

GHS Classification

ID34

1,1-Dimethyl-4,4-bipyridinium dichloride

CAS 1910-42-5

Date Classified: Jul. 24, 2006 (Environmental Hazards: Mar. 31, 2006)

Physical Hazards

Reference Manual: GHS Classification Manual (Feb. 10, 2006)

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Explosives	Not applicable	-	-	-	There are no chemical groups associated with explosive properties present in the molecules.
2 Flammable gases	Not applicable	-	-	-	Solid (GHS definition)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not applicable	-	-	-	Solid (GHS definition)
5 Gases under pressure	Not applicable	-	-	-	Solid (GHS definition)
6 Flammable liquids	Not applicable	-	-	-	Solid (GHS definition)
7 Flammable solids	Not classified	-	-	-	Non-combustible (ICSC (J) (2001))
8 Self-reactive substances and mixtures	Not applicable	-	-	-	There are no chemical groups associated with explosive or self-reactive properties present in the molecule.
9 Pyrophoric liquids	Not applicable	-	-	-	comes in contact with the air of the normal temperature.
10 Pyrophoric solids	Not classified	-	-	-	Non-combustible (ICSC (J), 2001)
11 Self-heating substances and mixtures	Not classified	-	-	-	Not combustible (ICSC(J) (2001))
12 Substances and mixtures, which in contact with water, emit flammable gases	Not classified	-	-	-	Stable to water. (The value of aqueous solubility is acquired. Moreover, the this product is marketed also as wettable powders (herbicide).)
13 Oxidizing liquids	Not applicable	-	-	-	Solid (GHS definition)
14 Oxidizing solids	Classification not possible	-	-	-	No data available
15 Organic peroxides	Not applicable	-	-	-	Organic compounds containing no -O-O- structure
16 Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to solid substances are not available. Corrosive to metals (Merck, 13th, 2001; ICSC(J), 2001)

Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Category 3	Skull and crossbones	Danger	Toxic if swallowed	Category 3 based on SPECIES: Rat (male); ENDPOINT: LD50; VALUE: 223mg/kg; REFERENCE SOURCE: Agricultural Chemicals Registration Data(1991)
1 Acute toxicity (dermal)	Category 2	Skull and crossbones	Danger	Fatal in contact with skin	It was set as Category 2 according to female rat LD50 = 79mg/kg of Agricultural Chemical Registration Data (1991).
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Solid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Not applicable	-	-	-	This product has very low vapor pressure (less than 0.01mPa at 25degC), and since vapor exposure was considered to be difficult, it was out of classification.
1 Acute toxicity (inhalation: dust, mist)	Category 1	Skull and crossbones	Danger	Fatal if inhaled	It was set as Category 1 rat LC50 = 0.00084mg/L (Agricultural Chemical Registration Data (1991)).
2 Skin corrosion / irritation	Category 2	Exclamation mark	Warning	Causes skin irritation	In Agricultural Chemical Registration Data (1991), several reports describe that the moderate stimulativeness was seen in 20% paraquat solution (several additive agents other than water are included) on rabbits skin irritation study, and redness and sloughing were seen in the pesticide formulations acute dermal toxicity tests on rats, etc. Therefore, it was thought to have relatively strong skin stimulativeness and classified as Category 2.
3 Serious eye damage / eye irritation	Category 2A	Exclamation mark	Warning	Causes serious eye irritation	Moderate stimulativeness was seen in the eye stimulativeness examination of the rabbit with the 20% paraquat solution (several sorts of additive agents other than aqueous were included) in Agricultural Chemical Registration Data (1991). And it did not recover completely at the end of a nine-day observation period, it was set as Category 2A.
4 Respiratory/skin sensitization	respiratory sensitization: Classification not possible; Skin sensitization: Not classified	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	Respiratory sensitization: No data. Skin sensitization: Classified as out of category because the skin sensitization test (Maximization method) using guinea pigs found no skin sensitization in Agricultural Chemical Registration Data (2004).
5 Germ cell mutagenicity	Not classified	-	-	-	There are 3 negative reports of in vivo mutagenicity tests using somatic cells in Agricultural Chemical Registration Data (1991) (2 bone-marrow chromosome aberration tests (one of these tests had statistically significant difference) and 1 bone-marrow micronucleus test). So the substance was regarded as outside the categories. The in vivo liver UDS test result was negative as well.
6 Carcinogenicity	Not classified	-	-	-	In the carcinogenicity tests of rat and mouse of Agricultural Chemical Registration Data (1991), neoplastic lesions relevant to the this product were not observed. So it was set as the outside of Category. In addition, it is classified into C (considerable out of Category) according to IRIS (1993).

7	Toxic to reproduction	Not classified	-	-	-	In the three-generation reproductive toxicity test of the rat, and in the teratogenicity test of rats and mice (Agricultural Chemical Registration Data (1991)), there was no obvious effect involved with the material, and they were considered as on the outside of Category
8	Specific target organs/systemic toxicity following single exposure	Category 1 (lung, kidneys, liver)	Health hazard	Danger	Cause damage to organs (lung, kidneys, liver)	The substance was classified as Category 1 (lungs, kidneys, liver). Because effects on the lungs regardless of the exposure routes (oral, percutaneous and inhalational) were observed in a rat acute toxicity test in Agricultural Chemical Registration Data (1991). And there is a report of effects on the kidneys and liver as well as lungs in an accident case with humans in ACGIH (7th, 2001) of Priority 1 document (there is a similar report in ICSC(J) of Priority 2 document (2004)).
9	Specific target organs/systemic toxicity following repeated exposure	Category 2 (lung)	Health hazard	Warning	may cause damage to organs (lung) through prolonged or repeated	In the rat repeated exposure test (feeding administration) of Agricultural Chemical Registration Data (1991), the lesion of the lung relevant to doses of this product was observed, and it was classified into Category 2 (lung) from comparison with the dosage in the toxicity appeared and the guidance value.
10	Aspiration hazard	Classification not possible	-	-	-	No data available

Environmental Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
11 Hazardous to the aquatic environment (acute)	Category 1	Environment	Warning	Very toxic to aquatic life	It was classified into Category 1 from 96-hour ErC50=0.6mg/L of algae (Green algae) (Agricultural Chemical Registration Data, 2004).
11 Hazardous to the aquatic environment (chronic)	Category 1	Environment	Warning	Very toxic to aquatic life with long lasting effects	Classified into Category 1, since acute toxicity was Category 1, not rapidly degrading (BOD: 0% (existing chemical safety inspections data)), though less bioaccumulative (BCF=0.3(existing chemical safety inspections data)).