

## GHS Classification

**ID13**

**1,1'-Ethylene-2,2'-bipyridinium dibromide**

**CAS 85-00-7**

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	Classification not possible	-	-	-	No data available
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	-	-	-	Based on the description as Not combustible (ICSC (2001)) and Not flammable (Weiss, 2nd (1985)), it was classified as out of Category.
8 Self-reactive substances and mixtures	Classification not possible	-	-	-	Classification not possible due to lack of data
9 Pyrophoric liquids	Not applicable	-	-	-	Solid (GHS definition)
10 Pyrophoric solids	Not classified	-	-	-	Not classified because of "Not combustible" (ICSC, 2001) and "Not flammable" (Weiss, 2nd, 1985)
11 Self-heating substances and mixtures	Not classified	-	-	-	Not classified because it is not combustible(ICSC, 2001) and not flammable(Weiss, 2nd, 1985)
12 Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	The chemical structure of the substance does not contain metals or metalloids(B, Si, P, Ge, As, Se, Sn, Sb, Te, Bi, Po, At).
13 Oxidizing liquids	Not applicable	-	-	-	Solid (GHS definition)
14 Oxidizing solids	Not applicable	-	-	-	Containing no oxygen, chlorine and fluorine.
15 Organic peroxides	Not applicable	-	-	-	There are no chemical groups associated with peroxide present in the molecule.
16 Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to solid substances are not available. The active ingredient is corrosive to metals.(HSDB, 2005)

## Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Category 3	Exclamation mark	Danger	Toxic if swallowed	It was set as Category 3 based on LD50 = 214mg/kg of oral administration in rats (Agricultural-Chemicals abstracts (1993)).
1 Acute toxicity (dermal)	Not classified	-	-	-	Since death was not observed in 2000mg/kg in rats dermal administration test (Agricultural-Chemicals abstracts (1993)), it was set as outside of Category.
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Solid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Classification not possible	-	-	-	No data available
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	-	-	-	Insufficient data available
2 Skin corrosion / irritation	Category 2	Exclamation mark	Warning	Causes skin irritation	In primary skin irritation test using rats, erythema was seen after the first application, and the applied part of skin epithelium and sloughing were seen after the second application. It recovered ten days after the third application, and new tissue was found regenerating at the applied part of the skin. Since diquat was considered to cause a mild irritation to the rat skin (Agricultural-Chemicals abstracts (1985)), it was classified as Category 2.
3 Serious eye damage / eye irritation	Category 2A	Exclamation mark	Warning	Causes serious eye irritation	Although the Draize score in the primary eye irritation examination with a rabbit was 8 for second day, since it was set to 2 seven days afterward and had recovered mostly after that (Agricultural-Chemicals abstracts (1985)), it was referred to as Category2A.
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Category 1	(Respiratory sensitization)-; (Skin sensitization)Exclamation mark	(Respiratory sensitization)-; (Skin sensitization)Warning	(Respiratory sensitization)-; (Skin sensitization)May cause allergic skin reaction	Respiratory sensitization: No data Skin sensitization: Classified as Category 1 because positive results (31% of positive rate) were obtained (agrochemical abstract (2004)) in the skin sensitization test using guinea pigs.
5 Germ cell mutagenicity	Not classified	-	-	-	Based on the negative results in the in vivo micronucleus test using mouse somatic cells (Agricultural-Chemicals abstracts (2004)) and in the in vivo chromosome aberration test using mouse somatic cells (Agricultural-Chemicals abstracts (1989)), we regarded the substance as outside the categories.
6 Carcinogenicity	Not classified	-	-	-	Since it was classified into A4 by ACGIH, it was set as the outside of Category. The carcinogenicity test results with rat and mouse (Agricultural-Chemicals abstracts (1985)) is also endorsing this classification.

7	Toxic to reproduction	Not classified	-	-	-	Since effects on reproductive function or fertility property are not observed in three generations of rat reproduction study(Agricultural-Chemicals abstracts (1977)) and bad effect to development of neonatal was not observed in a rat teratogenicity studies (Agricultural-Chemicals abstracts (1989)) or in a rabbit teratogenicity study (Agricultural-Chemicals abstracts (1985)), they were considered as on the outside of Category.
8	Specific target organs/systemic toxicity following single exposure	Category 1 (systemic toxicity)	Health hazard	Danger	Cause damage to organs (systemic toxicity)	An acute neurotoxicity study in rats showed no neurotoxicity, but diarrhea, piloerection, urinary incontinence, upward curvature of the spine, tiptoe gait, opisthotonus and motor suppression were observed in females which had been given 150mg/kg of the substance (equivalent to the guidance value for Category 1) (Agricultural Chemical Abstracts, (2004)). So the substance was classified as Category 1 (systemic toxicity).
9	Specific target organs/systemic toxicity following repeated exposure	Category 2 (eye)	Health hazard	Warning	may cause damage to organs (eye) through prolonged or repeated	Since the cataract was observed in the oral repeated administration toxicology studies in rat for 90 days (correspond at 400 ppm (male : 32.4, female : 38.5mg/kg/day, correspond to a guidance value of Category 2 ) (Agricultural Chemicals abstracts (2004)), it was classified into Category 2 (eye).
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 the 96-hour ErC50=19microg diquat ion /L of algae (Green algae)(Agricultural Chemical Registration Data, 2003) .
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=1.4 (existing chemical safety inspections data)).