

Technical Factsheet on: DIQUAT

[List of Contaminants](#)

As part of the Drinking Water and Health pages, this fact sheet is part of a larger publication:
National Primary Drinking Water Regulations

Drinking Water Standards

MCLG: 0.02 mg/L

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HAL(child): none

Health Effects Summary

Acute: EPA has found diquat to potentially cause the following health effects from acute exposures at levels above the MCL: dehydration.

Drinking water levels which are considered "safe" for short-term exposures have not been established.

Chronic: Diquat has the potential to cause the following health effects from long-term exposures at levels above the MCL: cataracts.

Cancer: There is inadequate evidence to state whether or not diquat has the potential to cause cancer from a lifetime exposure in drinking water.

Usage Patterns

Diquat is a herbicide that has been used extensively in the US since the late 1950s to control both crop and aquatic weeds. Its uses include potato haulm destruction; as a desiccant and defoliant to aid harvesting cotton, rapeseed and other oil seed crops; to pre-wilt silage, standing hay, etc. for storage; a plant growth regulator and sugar cane-flowering suppressant. Diquat usage in 1980 was estimated to be 200,000 lbs. of active ingredient. 1982 data indicates that diquat was not produced domestically, but imports were nearly 835,000 lbs. In 1982 it was estimated that diquat usage patterns were as follows: Industrial/commercial uses, 67%; aquatic uses, 33%.

Release Patterns

Diquat is released into the environment during its use as a contact herbicide, aquatic weed control agent, seed desiccant and sugarcane flowering suppressant agent. It may also be released into wastewater or in spills during its manufacture, transport and storage.

Since diquat is not a listed chemical in the Toxics Release Inventory, data on releases during its manufacture and handling are not available.

Environmental Fate

Diquat is rapidly adsorbed by clay constituents of soil and in the sorbed state is resistant to biodegradation and photodegradation. The duration of residual activity in soil is a few days; the deactivation resulting from its binding to the soil. In some soils such as montmorillonite clay, adsorption is considered irreversible. There is some evidence of a more loosely bound component, the fraction of which depends on the type of soil.

Diquat is removed rapidly from aquatic systems, principally by adsorption. If adsorption is initially to weeds, biodegradation to soluble or volatile products occurs in several weeks. When sorbed to sediment, little or no degradation probably occurs. In any case, the diquat disappears from the water in 2-4 weeks. Diquat will photodegrade in surface layers of water in 1-3 or more weeks when not adsorbed to particulate matter.

Should diquat be released to the atmosphere during spraying operations, it would be associated with aerosols. It will be subject to photolysis (half-life approx 48 hrs) and gravitational settling.

Little or no bioconcentration in fish will occur, as is expected for a chemical whose log octanol/water partition coefficient is -3.05. No residues were detected in organs or tissues of channel catfish collected from pools 5 months after a single application or 2 months after a second treatment of 1 ppm diquat.

Human exposure will principally be by agriculture workers or others who use the chemical or are in the vicinity of fields or bodies of water where diquat is used.

Chemical/ Physical Properties

CAS Number: 85-00-7

Color/ Form/Odor: Colorless to yellow crystals; water solution is dark reddish brown

M.P.: 335-340 C B.P.: N/A

Vapor Pressure: 1.3×10^{-5} mm Hg at 20 C

Octanol/Water Partition (Kow): Log Kow = -3.05

Density/Spec. Grav.: 1.22 - 1.27 at 20 C

Solubility: 700 g/L of water at 20 C; Very soluble in water

Soil sorption coefficient: Koc N/A; very low mobility in soil

Odor/Taste Thresholds: N/A

Bioconcentration Factor: Not expected to bioconcentrate in aquatic organisms.

Henry's Law Coefficient: N/A; no evaporation from water/soil

Trade Names/Synonyms: 1,1-Ethylene 2,2-dipyridylum dibromide; Reglone

Other Regulatory Information

Monitoring For Ground/Surface Water Sources:

Initial Frequency- 4 quarterly samples every 3 years

Repeat Frequency- If no detections during initial round:

2 quarterly per year if serving >3300 persons;

1 sample per 3 years for smaller systems

Triggers - Return to Initial Freq. if detect at > 0.0004 mg/L

Analysis:

Reference Source Method Numbers

EPA 600/4-88-039 549.1

Treatment- Best Available Technologies:
Granular Activated Charcoal

For Additional Information:

EPA can provide further regulatory and other general information:
EPA Safe Drinking Water Hotline - 800/426-4791

Other sources of toxicological and environmental fate data include:
Toxic Substance Control Act Information Line - 202/554-1404
Toxics Release Inventory, National Library of Medicine - 301/496-6531
Agency for Toxic Substances and Disease Registry - 404/639-6000
National Pesticide Hotline - 800/858-7378