



National Primary Drinking Water Regulations

Simazine

CHEMICAL/ PHYSICAL PROPERTIES

CAS NUMBER: 122-34-9

COLOR/ FORM/ODOR:
White powder

M.P.: 225° C B.P.: N/A

VAPOR PRESSURE: 6.1×10^{-9}

OCTANOL/WATER PARTITION (Kow):
Log Kow = 2.18

DENSITY/SPEC. GRAV.: 1.3g/ml at 20° C

SOLUBILITY: 5 mg/L of water at 20° C;
Soluble in water

ODOR/TASTE THRESHOLDS: N/A

SOIL SORPTION COEFFICIENT:
Koc = 135 (measured); slight to high
mobility in soil, depending upon other
factors

HENRY'S LAW COEFFICIENT:
 4.63×10^{-10} atm-cu m/mole

BIOCONCENTRATION FACTOR:

BCF <10 in fish; not expected to
bioconcentrate in aquatic organisms.

TRADE NAMES/SYNONYMS:

Aktinit; Batazina; Biternol;
CAT(Herbicide); CDT; Cekuzina-S;
Geigy 27,692; Gesatop; Herbazin;
Herbex; Hungazin; Premazine; Primatol
S; Pricep; Printop; Radocon; Simadex;
Tafazine; Zeapur; 2-chloro-4,6-
bis(ethylamino)-1,3,5-Triazine

DRINKING WATER STANDARDS

MCLG: 0.004 mg/L

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HAL(child): 1- to 10-day: 0.07 mg/L
Longer-term: 0.07 mg/L

Its major use is on corn where it is often combined with AATrex. Other herbicides with which simazine is combined include: paraquat, on apples, peaches; Roundup or Oust for noncrop use; Surflan on Christmas trees; Dual on corn and ornamentals.

The amount of simazine used annually in the USA was estimated in 1985 to be 4.8 billion pounds.

HEALTH EFFECTS SUMMARY

Acute: EPA has found simazine to potentially cause the following health effects from acute exposures at levels above the MCL: weight loss, changes in blood.

Drinking water levels which are considered "safe" for short-term exposures: For a 10-kg (22 lb.) child consuming 1 liter of water per day, up to a 7-year exposure to 0.07 mg/L.

Chronic: Simazine has the potential to cause the following health effects from long-term exposures at levels above the MCL: tremors; damage to testes, kidneys, liver and thyroid; gene mutations.

Cancer: There is some evidence that simazine may have the potential to cause cancer from a lifetime exposure at levels above the MCL.

USAGE PATTERNS

Simazine is a pre-emergence herbicide used for control of broad-leaved and grassy weeds on a variety of deep-rooted crops such as artichokes, asparagus, berry crops, broad beans, citrus, pome and stone fruits orchards, and others. It is also used on non-crop areas such as farm ponds, fish hatcheries, etc.

RELEASE PATTERNS

Simazine may be released into the environment via effluents at manufacturing sites and at points of application where it is employed as a herbicide.

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

ENVIRONMENTAL FATE

If released to water, simazine is not expected to adsorb to sediment and suspended particulate matter, or to volatilize. Persistence depends upon many factors including degree of algae and weed infestation. Simazine residues may persist up to 3 years in soil under aquatic field conditions. Dissipation of simazine in pond and lake water was variable, with half-lives ranging from 50 to 700 days. Slow biodegradation of simazine may occur in water based upon the slow biodegradation observed in soil. Simazine is fairly resistant to hydrolysis. However, chemical hydrolysis of simazine may be more important environmentally than biodegradation at low pH or when various catalysts are present.

If released to soil, the mobility of simazine will be expected to vary from slight to high in soil-types ranging from clay soils to sandy loams soils, respectively, based upon soil column, soil thin-layer chromatography, and Koc experiments. Therefore, it may leach to groundwater; adsorption of simazine in soil has been observed to increase as titratable acidity, organic matter and, to a lesser extent, clay content of the soil increased.

Simazine may be susceptible to slow hydrolysis in soil based upon reported half-lives for degradation (purportedly mainly soil catalyzed hydrolysis) of simazine in two soil 45 and 100 days.

Simazine can be utilized by certain soil microorganisms as a source of energy and mineralization. No degradation of simazine was detected in a soil suspension test without the addition of glucose as an energy source suggesting that degradation of simazine in these soil experiments was due to co-metabolism. Reported persistence of simazine in soil varies from a half-life of <1 month to no degradation being observed in 3.5 months. Simazine is not expected to volatilize from near surface soils or surfaces under normal environmental conditions.

If released to the atmosphere, simazine is expected to exist almost entirely in the particulate phase. Vapor phase reactions with photochemically produced hydroxyl radicals in the atmosphere may be important (estimated half-life of about 2.8 hr). Photolysis may be an important removal mechanism in the atmosphere.

Simazine has a low potential to bioaccumulate in fish. BCFs: 0.76-0.95, green sunfish ; <1, bluegill sunfish; 5, bluegill sunfish; 2, catfish. Other BCF values up to 55 have been reported in the literature.

The most probable exposure should be occupational exposure which may occur through dermal contact or inhalation at places where simazine is produced or used as a herbicide.

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 > 0.00007 mg/L

ANALYSIS:

REFERENCE SOURCE

EPA 600/4-88-039

METHOD NUMBERS

505; 507; 508.1; 525.2

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