

Chemical Safety Data Sheet MSDS / SDS

Acridine

Revision Date:2023-12-07 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name : Acridine
CBnumber : CB9853399
CAS : 260-94-6
EINECS Number : 205-971-6
Synonyms : Acridine,Akridin

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.
Uses advised against : none

Company Identification

Company : Chemicalbook
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone : 400-158-6606

SECTION 2: Hazards identification

Classification of the substance or mixture

Acute toxicity - Category 4, Oral

Label elements**Pictogram(s)**

☐

Signal word : Warning

Hazard statement(s)

H302 Harmful if swallowed

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation

H341 Suspected of causing genetic defects

Precautionary statement(s)

P201 Obtain special instructions before use.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 Wash hands thoroughly after handling.

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continuerinsing.

P405 Store locked up.

P501 Dispose of contents/container to.....

Prevention

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

Response

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Acridine
Synonyms	: Acridine,Akridin
CAS	: 260-94-6
EC number	: 205-971-6
MF	: C13H9N
MW	: 179.22

SECTION 4: First aid measures

Description of first aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately.

Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

Inhalation irritates respiratory system and causes sneezing, crying, and vomiting. Contact with liquid irritates eyes, skin, and mucous membranes. At high temperature and during sun exposure, damage to the cornea, skin, and mucous membranes may occur following the liberation of acridine vapor. (USCG, 1999)

Indication of any immediate medical attention and special treatment needed

Minimum/Potential Fatal Human Dose

3. 3= moderately toxic: probable oral lethal dose (human) 0.5-5 g/kg, between 1 oz & 1 pint (or 1 lb) for 70 kg person (150 lb).

Absorption, Distribution and Excretion

Acridine was rapidly accum from water by fathead minnows. equil concn within 24 hr @ concn factor ((acridine)fish,wet wt/(acridine)water) of 125 +/- 10. depuration was rapid. net elimination rate was 0.23/hr (acridine)fish @ equilibrium.

SECTION 5: Firefighting measures

Extinguishing media

If material on fire or involved in fire: Use water in flooding quantities as fog. Use "alcohol" foam, dry chemical or carbon dioxide. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. Keep run-off water out of sewers and water sources.

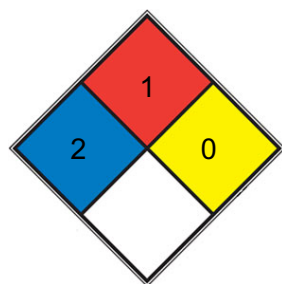
Specific Hazards Arising from the Chemical

Special Hazards of Combustion Products: Toxic oxides of nitrogen may form in fire. Behavior in Fire: Sublimes before melting (USCG, 1999)

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

NFPA 704



■ HEALTH 2 Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. [diethyl ether](#), ammonium phosphate, iodine)

■ FIRE 1 Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F). (e.g. [mineral oil](#), ammonia)

■ REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N2](#))

□ SPEC.
□ HAZ.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Materials which are toxic as stored or which can decompose into toxic components...should be stored in a cool, well ventilated place, out of the direct rays of the sun, away from areas of high fire hazard, and should be periodically inspected. incompatible materials should be isolated...

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Crystalline Powder
Colour	Yellow to yellow-brown
Odour	no data available
Melting point/freezing point	189°C(lit.)
Boiling point or initial boiling point and boiling range	61°C/12mmHg(lit.)
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	65°C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	A WEAK BASE, COLORS LITMUS PAPER BLUE
Kinematic viscosity	no data available
Solubility	dioxane: 0.1 g/mL, clear
Partition coefficient n-octanol/water	Log P= 3.40
Vapour pressure	0.000113mmHg at 25°C
Density and/or relative density	1.005
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

Slightly soluble in hot water.

Chemical stability

Volatile with steam

Possibility of hazardous reactions

ACRIDINE neutralizes acids in exothermic reactions to form salts plus water. May be incompatible with isocyanates, halogenated organics, peroxides, phenols (acidic), epoxides, anhydrides, and acid halides. Flammable gaseous hydrogen may be generated in combination with strong reducing agents, such as hydrides. Burns to give toxic oxides of nitrogen.

Conditions to avoid

no data available

Incompatible materials

STABILITY: This chemical undergoes photo-oxidation after irradiation in indoor sunlight or by fluorescent light in organic solvents. Solutions of this chemical in benzene oxidize under the influence of light and air. Solutions of this chemical in water, DMSO, 95% ethanol or acetone should be stable for 24 hours under normal lab conditions. REACTIVITY: This chemical is incompatible with strong oxidizers. It readily undergoes nitration and halogenation. Ozone, chromic acid and chlorinating agents oxidize this compound. This chemical may react with organic and inorganic oxidants including various electrophiles, peroxides, nitrogen oxides and sulfur oxides. Hydrogenation occurs with platinum oxide. (NTP, 1992)

Hazardous decomposition products

When heated to decomposition, acridine emits toxic fumes.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

EPA-B2, IARC-1, NIOSH-Ca, NTP-R, TLV-A2

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

The biodegradation of acridine at concentrations from 0.1 to 20 mg/l was measured in river die-away tests using Green River water; over 11 days this compound was not significantly biodegraded at any measured concentration(1). Acridine at 500 mg/kg soil was measurably present for 83 days in chernozem soil samples at a temperature of 19 deg C(2). A half-life of 3 days in soil was reported for acridine when present at a concentration of 5 mg/kg(3). Acridine, initially present in a groundwater sample at 22.5 ug/ml, was inoculated with creosote-contaminated surface soil; 19, 37, 91.5, 91, and 91% of this compound was biodegraded following 1, 3, 5, 8, and 14 days incubation(4). The sterile control was not degraded over 14 days(4). During solid-phase bioremediation of creosote/PCP contaminated surface soils, unamended soils, containing acridine initially at 46.8 mg/landfarming chamber (3 kg) biodegraded this compound by 83% over 12 weeks(5). In similar experiments using surficial soil, 32% biodegradation was reported over 12 weeks with an initial acridine concentration of 14569.7 mg/landfarming chamber (3 kg)(5). The presence of 9-acridinone in groundwater samples possibly indicates that this compound may be the final product of the biodegradation of acridine in contaminated aquifers(6).

Bioaccumulative potential

In a static bioconcentration test, a BCF value of 1300 was measured in the guppy, *Poecilia reticulata*(1). Rate constants for uptake and depuration were 40.8 and 0.031/hour, respectively(1). An equilibrium BCF of 30 was measured for acridine in *Daphnia pulex*; rate constants for uptake and depuration were 109.6 and 0.47/hour, respectively(2). A BCF value of 126 was measured in fathead minnows(3). Fathead minnows, exposed to 100 ug/L acridine in a flow-through spring water system, rapidly accumulated acridine directly from the water with concentrations of about 12 ug/g wet attained in the fish after 24 hours giving a BCF of 125(4). Further exposure did not result in higher levels of acridine in these fish(4). Rate constants for uptake and depuration were 14 and 0.112/hour, respectively(4). Uncontaminated water rapidly contained measurable concentrations of acridine once minnows containing this compound were added to the water; this suggests that acridine can be eliminated without metabolic alteration as well as through metabolic degradation(4). Minnows exposed to acridine-contaminated sediment and a low level of dissolved acridine did not accumulate much acridine from the sediment(4). According to a classification scheme(5), these BCF values suggest that bioconcentration in aquatic organisms is low to very high depending on the aquatic organism studied(SRC); however, this compound appears to be readily depurated in several organisms. Mussels, *Elliptio complanata*, did not accumulate detectable concentrations of acridine following three weeks exposure to contaminated sediments in the St. Mary's River in 1985 (detection limit= 1 ug/kg

wet weight)(6).

Mobility in soil

Fourteen soil and sediment samples, collected from the Ohio, Missouri, Mississippi, and Illinois rivers and their watersheds had a wide range in pH (4.54-8.34), total clay (6.8 to 69.1%), organic carbon (0.11 to 2.38%), and expanding clay (2.0 to 60.0%). Koc values for acridine added to these soils/sediments ranged from 5500 to 30,909 with an average value of 12,910(1). According to a recommended classification scheme(2), these measured Koc values suggest that acridine will be immobile in soil(SRC). Adsorption of acridine to silica was measured in a continuous-flow column. The extent of adsorption was greater when the solution pH was below the pKa of acridine(pKa= 5.68(3)) than when it was above(4). Therefore, mobility should be greater in a sand soil when the pH is above the pKa of acridine and adsorption is greatest when the solution pH equals acridine's pKa(4). Sorption of acridine to two low organic carbon subsurface materials with similar properties but different equilibrium pH values when saturated with water was measured(5). Higher sorption was reported for the Loring subsoil (0.24% organic carbon, pH 4.85) than the Anvil Points subsoil (0.58% organic carbon, pH 8.15), consistent with compound ionization and preferential retention of the organic cation over the neutral compound(5).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN2713 (For reference only, please check.)

IMDG: UN2713 (For reference only, please check.)

IATA: UN2713 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: ACRIDINE (For reference only, please check.)

IMDG: ACRIDINE (For reference only, please check.)

IATA: ACRIDINE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)

IMDG: 6.1 (For reference only, please check.)

IATA: 6.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: III (For reference only, please check.)

IMDG: III (For reference only, please check.)

IATA: III (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

PICCS

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Not Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

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