SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 18, 2017

Revision Date: Aug 18, 2017

1. Identification

1.1 GHS Product identifier

Product name	monuron

1.2 Other means of identification

Product number	-
Other names	Monuruon

1.3 Recommended use of the chemical and restrictions on use

Identified uses	For industry use only.
Uses advised against	no data available

2. Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Oral, Category 4

Carcinogenicity, Category 2

Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)

Signal word	Warning
Hazard statement(s)	H302 Harmful if swallowed
	H351 Suspected of causing cancer
	H410 Very toxic to aquatic life with long lasting effects
Precautionary statement(s)	
Prevention	P264 Wash ... thoroughly after handling.
	P270 Do not eat, drink or smoke when using this product.
	P201 Obtain special instructions before use.
	P202 Do not handle until all safety precautions have been read and understood.
	P280 Wear protective gloves/protective clothing/eye protection/face protection.
	P273 Avoid release to the environment.
Response	P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/…if you feel unwell.
	P330 Rinse mouth.
	P308+P313 IF exposed or concerned: Get medical advice/ attention.
	P391 Collect spillage.
Storage	P405 Store locked up.
Disposal	P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

none

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3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
monuron	monuron	150-68-5	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms/effects, acute and delayed

SYMPTOMS: Symptoms of exposure to this compound may include fall in blood pressure, convulsions or coma. Other symptoms may include ataxia, drowsiness, hyporeflexia, pallor, tachypnea, dacryorrhea, aciduria, diarrhea, epistaxis, hyperreflexia and irritability. ACUTE/CHRONIC HAZARDS: When heated to decomposition this compound emits very toxic fumes of nitrogen oxides and chlorine.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

1. SKIN CONTAMINATION SHOULD BE REMOVED PROMPTLY BY WASHING WITH SOAP AND WATER. CONTAMINATION OF THE EYES SHOULD BE TREATED IMMEDIATELY BY PROLONGED FLUSHING OF THE EYES WITH COPIOUS AMOUNTS OF CLEAN WATER. IF DERMAL OR OCULAR IRRITATION PERSISTS,

MEDICAL ATTENTION SHOULD BE OBTAINED WITHOUT DELAY. /OTHER HERBICIDES/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Self-contained breathing apparatus, rubber gloves, hats, suits, and boots must be worn.

5.2 Specific hazards arising from the chemical

Flash point data for this chemical are not available; however, it is probably combustible.

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

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

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust

ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep in well ventilated area.

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8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. 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

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	PHYSICAL DESCRIPTION: White crystalline solid or white powder with a slight odor. Melting point 175°C. Moderately toxic by ingestion. Used as an herbicide.
Colour	WHITE PLATES FROM METHANOL
Odour	SLIGHT ODOR
Melting point/ freezing point	173-174°C(lit.)
Boiling point or initial boiling point and boiling range	358.8°C at 760mmHg
Flammability	no data available
Lower and upper explosion limit / flammability limit	no data available
Flash point	170.8°C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	6.26 SATURATED AQ SOLUTION
Kinematic viscosity	no data available
Solubility	less than 1 mg/mL at 21.5°C
Partition coefficient n-octanol/water (log value)	log Kow= 1.94 (est)
Vapour pressure	5e-07 mm Hg at 25°C ; 0.00178 mm Hg at 100°C
Density and/or relative density	1.27 g/cm3
Relative vapour density	no data available
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Negligible hydrolysis at room temp in neutral solutions.

10.3 Possibility of hazardous reactions

... NON-FLAMMABLE.MONURON is a chlorinated urea derivative. May react with azo and diazo compounds to generate toxic gases. May react with strong reducing agents to generate flammable gases. Reacts as a weak base. Combustion generates mixed oxides of nitrogen (NOx).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

When heated to decomposition it emits very toxic fumes of oxides of nitrogen and /hydrogen/ chloride ions.

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11. Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 3600 mg monuron/kg
- 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

Evaluation: No data were available from studies in humans. There is limited evidence in experimental animals for the carcinogenicity of monuron. Overall evaluation: Monuron is not classifiable as to its carcinogenicity to humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 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

12.2 Persistence and degradability

/INVESTIGATORS/ ... WERE ABLE TO ISOLATE FROM BROOKSTON SILTY CLAY LOAM A BACTERIUM OF GENUS PSEUDOMONAS WHICH UTILIZED MONURON AS SOLE SOURCE OF CARBON.

12.3 Bioaccumulative potential

From its water solubility and a regression equation, the bioconcentration factor (BCF) for monuron in aquatic organisms has been estimated to be 29(1). Based on a log Kow value of 1.94(2) and a regression equation(3), the BCF value can be estimated to be 17(SRC). Both these values indicate that bioconcentration of monuron in aquatic organisms should not be important(1,SRC). The low rate of uptake and fast depuration (depuration half-life of 0.45 days) of monuron from

catfish (Ictalurus melas)(4) also indicates that bioconcentration will not be important(SRC).

12.4 Mobility in soil

The Koc values for monuron determined from experimental adsorption isotherms or estimated using recommended regression equations range from 83 to 225(1-6). According to a suggested classification scheme(9), Koc values of this magnitude indicate that monuron is moderately to highly mobile in soil. Soil thin layer chromatographic studies also indicate that monuron is moderately mobile in soil(5,7). The adsorption of monuron in soil is virtually independent of pH and clay content of soil, but the adsorption increases with increase in organic carbon content(6,8). However, other investigators concluded that the adsorption of monuron increases with an increase in the clay content of soil(10).

12.5 Other adverse effects

no data available

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13. Disposal considerations

13.1 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.

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14. Transport information

14.1 UN Number

ADR/RID: UN3077 IMDG: UN3077 IATA: UN3077

14.2 UN Proper Shipping Name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

14.3 Transport hazard class(es)

ADR/RID: 9 IMDG: 9 IATA: 9

14.4 Packing group, if applicable

ADR/RID: III IMDG: III IATA: III

14.5 Environmental hazards

ADR/RID: yes IMDG: yes IATA: yes

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

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15. Regulatory information

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

Chemical name	Common names and synonyms	CAS number	EC number
monuron	monuron	150-68-5	none
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			Not Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Not Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

16. Other information

Information on revision

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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/
