

SAFETY DATA SHEET

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This revision issued: October, 2015

Section 1 - Identification of The Material and Supplier



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Trade Name: Sirion Herbicide
APVMA Code: 56744
Chemical nature: Molinate is a thiocarbamate derivative.
Product Use: Agricultural herbicide for use as described on the product label.
Creation Date: February, 2004
This version issued: October, 2015 and is valid for 5 years from this date.

Section 2 - Hazards Identification

Statement of Hazardous Nature

This product is classified as: Hazardous according to the criteria of SWA Australia.

Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code.

Risk Phrases: R22. Harmful if swallowed.

Safety Phrases: S20. When using, do not eat or drink.

SUSMP Classification: S6

ADG Classification: None allocated. Not a Dangerous Good.

UN Number: None allocated



GHS Signal word: WARNING.

HAZARD STATEMENT:

H302: Harmful if swallowed.

PREVENTION

P102: Keep out of reach of children.

P262: Do not get in eyes, on skin, or on clothing.

P264: Wash contacted areas thoroughly after handling.

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

P281: Use personal protective equipment as required.

RESPONSE

P337: If eye irritation persists: seek medical attention.

P352: Wash with plenty of soap and water.

P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P370+P378: In case of fire, use carbon dioxide, dry chemical, foam, water fog.

STORAGE

P410: Protect from sunlight.

P402+P404: Store in a dry place. Store in a closed container.

P403+P235: Store in a well-ventilated place. Keep cool.

DISPOSAL

P501: Dispose of contents and containers as specified on the registered label.

Emergency Overview

Physical Description & colour: Yellow to light brown coloured liquid.

Odour: Offensive odour.

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Major Health Hazards: harmful if swallowed. Symptoms of exposure to Molinate include nausea, diarrhoea, abdominal pain, fever, weakness, and conjunctivitis.

Potential Health Effects

See section 11 for Chronic exposure studies.

Inhalation

Short term exposure: Significant inhalation exposure is considered to be unlikely. Available data indicates that this product is not harmful. In addition product is unlikely to cause any discomfort or irritation.

Skin Contact:

Short term exposure: Available data indicates that this product is not harmful. It should present no hazards in normal use. However product may be irritating, but is unlikely to cause anything more than mild transient discomfort.

Eye Contact:

Short term exposure: Exposure via eyes is considered to be unlikely. This product may be irritating to eyes, but is unlikely to cause anything more than mild transient discomfort.

Ingestion:

Short term exposure: Significant oral exposure is considered to be unlikely. Available data shows that this product is harmful, but symptoms are not available. This product is unlikely to cause any irritation problems in the short or long term.

Carcinogen Status:

SWA: No significant ingredient is classified as carcinogenic by SWA.

NTP: No significant ingredient is classified as carcinogenic by NTP.

IARC: No significant ingredient is classified as carcinogenic by IARC.

Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Conc,%	TWA (mg/m ³)	STEL (mg/m ³)
Molinate	2212-67-1	96	not set	not set
Other non hazardous ingredients	secret	to 100	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that should not be exceeded for more than 15 minutes and should not be repeated for more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak" is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

Section 4 - First Aid Measures

General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

Inhalation: First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Skin Contact: Irritation is unlikely. However, if irritation does occur, flush with lukewarm, gently flowing water for 5 minutes or until chemical is removed. If in doubt obtain medical advice.

Eye Contact: No effects expected. If irritation does occur, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the product is removed. Obtain medical advice if irritation becomes painful or lasts more than a few minutes.

Ingestion: If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards: This product is classified as a C2 combustible product. There is a slight risk of an explosion from this product if commercial quantities are involved in a fire. Violent steam generation or eruption may occur upon application of direct water stream on hot liquids. Vapours from this product are heavier than air and may accumulate in sumps, pits and other low-lying spaces, forming potentially explosive mixtures. They may also flash back considerable distances.

Fire decomposition products from this product may be toxic if inhaled. Take appropriate protective measures.

Extinguishing Media: Preferred extinguishing media are carbon dioxide, dry chemical, foam, water fog.

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Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade.

Flash point: Not flammable.

Upper Flammability Limit: No data.

Lower Flammability Limit: No data.

Autoignition temperature: No data.

Flammability Class: C2

Section 6 - Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses.

Immediately call the Fire Brigade. As a minimum, wear overalls, goggles and gloves. Suitable materials for protective clothing include rubber, PVC. Eye/face protective equipment should comprise as a minimum, protective glasses and, preferably, goggles. If there is a significant chance that vapours or mists are likely to build up in the cleanup area, we recommend that you use a respirator. Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above.

Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. If spill is too large or if absorbent material is not available, try to create a dike to stop material spreading or going into drains or waterways. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is any conflict between this MSDS and the label, instructions on the label prevail. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

Section 7 - Handling and Storage

Handling: Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

Storage: Note that this product is combustible and therefore, for Storage, meets the definition of Dangerous Goods in some states. If you store large quantities (tonnes) of such products, we suggest that you consult your state's Dangerous Goods laws in order to clarify your obligations regarding their storage.

Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight. Make sure that the product does not come into contact with substances listed under "Materials to avoid" in Section 10. Some liquid preparations settle or separate on standing and may require stirring before use. Check packaging - there may be further storage instructions on the label.

Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Occupational Protective Clothing: AS/NZS 4501 set 2008, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

SWA Exposure Limits **TWA (mg/m³)** **STEL (mg/m³)**

Exposure limits have not been established by SWA for any of the significant ingredients in this product.

The ADI for Molinate is set at 0.002mg/kg/day. The corresponding NOEL is set at 0.2mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, June 2014.

Ventilation: No special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that vapours and mists are minimised.

Eye Protection: Eye protection such as protective glasses or goggles is recommended when this product is being used.

Skin Protection: You should avoid contact even with mild skin irritants. Therefore you should wear suitable impervious elbow-length gloves and facial protection when handling this product. See below for suitable material types.

Protective Material Types: We suggest that protective clothing be made from the following materials: rubber, PVC.

Respirator: Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above.

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Section 9 - Physical and Chemical Properties:

Physical Description & colour:	Yellow to light brown coloured liquid.
Odour:	Offensive odour.
Boiling Point:	>185°C at 100kPa
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.
Volatiles:	No specific data. Expected to be low at 100°C.
Vapour Pressure:	No data.
Vapour Density:	No data.
Specific Gravity:	No data.
Water Solubility:	Emulsifiable.
pH:	No data.
Volatility:	No data.
Odour Threshold:	No data.
Evaporation Rate:	No data.
Coeff Oil/water distribution:	No data
Autoignition temp:	No data.

Section 10 - Stability and Reactivity

Reactivity: This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.

Conditions to Avoid: Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight.

Incompatibilities: strong acids, strong bases, strong oxidising agents.

Fire Decomposition: Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas. Oxides of sulfur (sulfur dioxide is a respiratory hazard) and other sulfur compounds. Most will have a foul odour. Water. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death. Hydrogen cyanide poisoning signs and symptoms are weakness, dizziness, headache, nausea, vomiting, coma, convulsions, and death. Death results from respiratory arrest. Hydrogen cyanide gas acts very rapidly; symptoms and death can both occur quickly.

Polymerisation: This product is unlikely to undergo polymerisation processes.

Section 11 - Toxicological Information

Toxicity: Acute toxicity: Molinate is harmful by ingestion with accepted oral LD50 values of 700(♀) to 730(♂)mg/kg in rats (US EPA, 2002). Dermal LD50 values are 4000 to 4800 mg/kg in rats. It is mildly irritating to rabbit skin and moderately irritating to rabbit eyes, and is not a skin sensitizer. The 4-hour inhalation LC50 of 1.36 mg/L indicates moderate toxicity by this route as well. Some formulations show a lower degree of acute toxicity. Symptoms of exposure to Molinate include nausea, diarrhoea, abdominal pain, fever, weakness, and conjunctivitis.

Chronic toxicity: The only reported human exposure to Molinate resulting in adverse health effects comes from a report of well contamination in Japan. After field application of approximately 60 kg active ingredient to a 2-hectare rice paddy, several people noticed an odor emitted from a nearby well, and fell ill as a result of repeated consumption of water from that well. Their symptoms, which were apparently quite rapid in onset, included abdominal and gastrointestinal disorders, fever, weakness, and conjunctivitis. These symptoms disappeared following the use of an alternative water source, and there were no reports of long-term complications or lingering effects due to this exposure. The concentration of the well water sampled 15 days following the first reported symptoms was 6 (g/L; it is not known what the initial concentration was.

Reproductive effects: Administration of Molinate to young male rats at a dose of 3.6 mg/kg/day for 2 months caused changes in spermatozoa but did not decrease sperm fertility. When these rats were mated to normal females, many of the embryos were resorbed and postnatal mortality was increased. It is unlikely that such effects will occur in humans at expected exposure levels.

Teratogenic effects: Reports on the teratogenicity of Molinate are conflicting, with one suggestion that it is teratogenic and another that it is not. Thus, its teratogenicity is unknown.

Mutagenic effects: No data were located regarding the potential mutagenic effects of Molinate although it has been reported to be nongenotoxic.

Carcinogenic effects: In a 2-year assay in rats, no carcinogenic activity was reported at doses up to 2 mg/kg/day.

Organ toxicity: The primary target organ affected by Molinate is the thyroid.

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Fate in humans and animals: Molinate is only fairly well absorbed through oral, dermal, and inhalation exposure. It is metabolized in the rat liver, and rapid excretion occurs primarily through the urine (88% of the applied dose) with a small amount lost in the faeces (11% of the applied dose). Excretion by rats was practically complete within 48 hours.

Section 12 - Ecological Information

Effects on birds: Molinate appears to be practically nontoxic to birds. The reported 5-day dietary LC50 in Japanese quail is greater than 5000 ppm, and that in mallards is greater than 13,000 ppm.

Effects on aquatic organisms: The reported toxicity to fish varies greatly, from slightly to highly toxic. One source reports the 96-hour LC50 values at 0.21 mg/L in rainbow trout and 0.32 mg/L in bluegill sunfish, while another reports them as 1.3 and 29 mg/L, respectively. A 96-hour LC50 value of 30 mg/L in goldfish has also been reported. Fish kills of carp due to Molinate were observed in Japan. The pesticide caused an anemia-like condition in these fish. Reported 96-hour LC50 values in aquatic invertebrates such as Daphnia and stone flies are about 0.3 to 0.6 mg/L, indicating that Molinate is highly toxic to these invertebrates.

Effects on other organisms: No data are currently available.

Environmental Fate:

Breakdown in soil and groundwater: Molinate is of low persistence in the soil environment, with a field half-life of 5 to 21 days. It is poorly bound to soils, soluble in water, and thus may be mobile and present a risk to groundwater contamination. Soil microorganisms are responsible for most Molinate breakdown. Molinate may rapidly volatilize if not ploughed into the soil, and may undergo breakdown by sunlight.

Breakdown in water: Molinate may be degraded by hydrolysis (reaction with water).

Breakdown in vegetation: Molinate is rapidly taken up by plant roots and transported to the leaves. In the leaves, Molinate inhibits leaf growth and development. It is rapidly metabolized to carbon dioxide and other naturally occurring plant products such as amino acids and organic acids in non-susceptible plants.

Section 13 - Disposal Considerations

Disposal: Special help is available for the disposal of Agricultural Chemicals. The product label will give general advice regarding disposal of small quantities, and how to cleanse containers. However, for help with the collection of unwanted rural chemicals, contact ChemClear 1800 008 182 <http://www.chemclear.com.au/> and for help with the disposal of empty drums, contact DrumMuster <http://www.drummuster.com.au/> where you will find contact details for your area.

Section 14 - Transport Information

ADG Code: This product is not classified as a Dangerous Good. No special transport conditions are necessary unless required by other regulations.

Section 15 - Regulatory Information

AICS: All of the significant ingredients in this product are compliant with NICNAS regulations. The following ingredients: Molinate, are mentioned in the SUSMP.

Section 16 - Other Information

This MSDS contains only safety-related information. For other data see product literature.

Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail, 7th Edition
AICS	Australian Inventory of Chemical Substances
CAS number	Chemical Abstracts Service Registry Number
Hazchem Number	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
SWA	Safe Work Australia, formerly ASCC and NOHSC
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
R-Phrase	Risk Phrase
SUSMP	Standard for the Uniform Scheduling of Medicines & Poisons
UN Number	United Nations Number

Contact Points:

Police and Fire Brigade:	Dial	AUSTRALIA 000
If ineffective:	Dial	1100 (Exchange)

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For emergency response:

Dial

1800 033 111

National Poisons Information Centre:

Dial 13 1126 (from anywhere in Australia)

Please read all labels carefully before using product.

The Safety Data Sheet (SDS) augments the label and should not be used in place of regulatory approved product labels which are attached to or accompanying the product container. This SDS provides important health, safety and environmental information for personnel that are manufacturing, distributing, transporting and storing the product, including emergency responders and other product handlers. The label provides information specifically for product users.

This SDS is prepared in accord with the SWA document "Preparation of Safety Data Sheets for Hazardous Chemicals - Code of Practice" (December 2011)

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