



SAFETY DATA SHEET SODIUM MOLYBDATE ANHYDROUS REVISION 4, DATE 26 AUG 2021

1. IDENTIFICATION

Product Name	Sodium Molybdate Anhydrous
Other Names	No Data Available
Uses	Micronutrient in fertilizers and feed additives; Corrosion inhibitor; Manufacture of pigments; Industrial detergent for metal surface treatment; Cleaning & maintenance; As coolant/anti-freeze/heat transfer fluid; Metal working fluids; Lubrication additives, lubricants and greases; Manufacture of enamels frits, ceramics; Water treatments chemicals; Polymer preparations & compounds; pH regulator, flocculants, precipitants, neutralization agents; Extraction agents; Photochemicals; Catalysts, inc. regeneration & recycling.
Chemical Family	No Data Available
Chemical Formula	MoO ₄ .2Na
Chemical Name	Sodium molybdate, anhydrous
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Suite 13A.03, Menara Summit Persiaran Kewajipan USJ1 47600 UEP Subang Jaya Selangor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Australia – Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
National Poison Centre	Malaysia	+60-4-6536-999
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887



2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Not Scheduled

Globally Harmonised System

Hazard Classification NOT hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Signal Word None

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

3. COMPOSITION/INFORMATION ON INGREDIENTS*Ingredients*

Chemical Entity	Formula	CAS Number	Proportion
Sodium molybdate, anhydrous	Na ₂ MoO ₄	7631-95-0	100 %

4. FIRST AID MEASURES*Description of necessary measures according to routes of exposure*

Swallowed	IF SWALLOWED: Rinse mouth. Get medical advice/attention if you feel unwell.
Eye	IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. If eye irritation persists, get medical advice/attention.
Skin	IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention. Apply resuscitation if victim is not breathing - Administer oxygen if breathing is difficult.
Advice to Doctor	Treat symptomatically.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
Flammability Conditions	Sodium molybdate is not flammable/combustible and it does not support fires.
Extinguishing Media	If material is involved in a fire use dry chemical, Carbon dioxide (CO ₂), foam or water spray for extinction. Use fire fighting

measures that suit the location and surroundings.

Fire and Explosion Hazard	No information available.
Hazardous Products of Combustion	Fire or heat may produce irritating, toxic and/or corrosive fumes, including Sodium oxides.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may pollute waterways.
Personal Protective Equipment	Wear SCBA and chemical splash suit. SCBA and structural firefighter's uniform may provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. Do not touch or walk through spilled material. Avoid generating dust. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Collect spilled material in suitable containers or bags for recovery or disposal. In the case of disposal, spilled material or contaminated material should be disposed of as waste (see SECTION 13). *Use an appropriate industrial vacuum cleaner, equipped with ULPA or HEPA filters.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas.
Decontamination	No information available.
Environmental Precautionary Measures	In the event of an accidental release, the product should be prevented from reaching the sewage system or any water course, and from penetrating the ground/soil.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Use personal protective equipment as required (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be available within the immediate work area for emergency use. Ensure adequate ventilation - Use only outdoors or in a well-ventilated area. Handle in accordance with good industrial hygiene and safety practice. Avoid generating dust. Avoid breathing dusts or mists and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8).
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Keep away from foodstuffs and incompatible materials (see SECTION 10).
Container	Do not store in open, inadequate or mislabelled packaging.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. For Molybdenum, soluble compounds (as Mo): - Safe Work Australia Exposure Standard: TWA = 5 mg/m ³
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.
Personal Protection Equipment	- Respiratory protection: In case of inadequate ventilation, wear respiratory protection. Recommended: Dust

mask/particulate respirator (refer to AS/NZS 1715 & 1716).

- Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Wear safety glasses with side shields or goggles.

- Hand protection: Handle with gloves. Recommended: Impervious gloves.

- Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact.

Special Hazards Precautions

Molybdate originating from Sodium Molybdate Anhydrous can contribute to the onset of molybdenosis (which is a molybdenum-induced copper deficiency) in ruminants such as cattle, deer and sheep. The level and bio-availability of copper in the animal diet are critical factors in the onset of molybdenosis. The recommended minimum dietary Cu:Mo mass ratio threshold to prevent molybdenosis is 1.30, i.e. there should be 30% more copper than molybdenum in the (note: mass ratio, not molar ratio). Cu & Mo content in the diet can be monitored, and if the ratio is < 1.3 then provide Cu supplements such as copper sulphate enriched feeds or copper sulphate enriched salt blocks for ruminants to use ad libitum. If there are ruminants in the vicinity of the plant, identify direct and diffuse air emission sources at the plant and carry out and record emission minimisation measures. Have an animal health check programme in place (e.g. blood tests for copper) to verify that the measures are effective.

Work Hygienic Practices

Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Take off contaminated clothing and wash before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Crystalline
Odour	Odourless
Colour	Colourless to white
pH	7 - 10 (neat)
Vapour Pressure	Low to negligible (@ No Data Available)
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	687 °C (anhydrous)
Freezing Point	No Data Available
Solubility	654 g/L in water 20°C
Specific Gravity	2.59
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	Negligible at ambient temperatures
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	ca. 100 °C
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available

Additional Characteristics	No information available.
Potential for Dust Explosion	No information available.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	Sodium molybdate is not flammable/combustible and it does not support fires.
Reactions That Release Gases or Vapours	Fire or heat may produce irritating, toxic and/or corrosive fumes, including Sodium oxides.
Release of Invisible Flammable Vapours and Gases	No information available.

10. STABILITY AND REACTIVITY

General Information	In the preparation of dyestuffs from aniline, nitrobenzene (as oxidant), hydrochloric acid and sodium hydroxide, ferric chloride is often used as catalyst, but Sodium Molybdate was substituted as a more effective catalyst. The materials were charged into a 4.5 m3 reactor and heating was started after addition of nitrobenzene, but the temperature controller was mis-set, and overheating at a high rate ensued. The exothermic reaction was much higher than normal because of the more effective catalyst, and partial failure of the cooling water led to an uncontrollable exothermic reaction.
Chemical Stability	Stable under ambient temperatures and pressures.
Conditions to Avoid	Avoid generating dust. Avoid exposure to extreme temperatures, contact with incompatible chemicals, uncontrolled contact with accelerants.
Materials to Avoid	Incompatible/reactive with oxidizing agents and alkali metals. *Sodium Molybdate will violently react with interhalogens (e.g., bromine pentafluoride; chlorine trifluoride). Molybdates react violently or explosively when reduced to molybdenum by heating with zirconium. Sodium Molybdate will explode on contact with molten magnesium.
Hazardous Decomposition Products	Fire or heat may produce irritating, toxic and/or corrosive fumes, including Sodium oxides.
Hazardous Polymerisation	Hazardous Polymerization is not reported.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: Low acute toxicity. - Skin corrosion/irritation: Dust may cause irritation. - Eye damage/irritation: Dust may cause irritation. - Respiratory/skin sensitisation: Sodium Molybdate is not sensitising to the skin. There is no data indicating respiratory sensitisation. - Germ cell mutagenicity: Not a germ cell mutagen. Negative test results three tests with Sodium Molybdate for: Bacterial reverse mutation assay, in vitro micronucleus assay in human lymphocytes, and in vitro gene mutation assay (tk) in mouse lymphoma cells. - Carcinogenicity: Not a carcinogen. - Reproductive toxicity: There are currently no reliable scientific data available indicating adverse effects on human reproduction or fertility. - STOT (single exposure): There are no specific target organ effects after single exposure to Sodium Molybdate. May cause irritation to the respiratory system. - STOT (repeated exposure): No reliable scientific data available indicating adverse systemic effects after repeated exposure to molybdenum substances. - Aspiration toxicity: No information available.
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Acute

Ingestion	Acute toxicity (Oral): - LD50, Rat (male): 4,040 mg/kg - LD50, Rat (female): 4,461 mg/kg
Other	Acute toxicity (Dermal): - LD50, Rat (male/female): >2,000 mg/kg bw.
Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic toxicity: - The lowest acute reference values for fish, invertebrates and algae are > 100 mg Mo/L. - The lowest aquatic NOEC for these three trophic levels is > 1 mg Mo/L (i.e. 43. 2 mg Mo/L for the rainbow trout).
Persistence/Degradability	Sodium Molybdate – when released into the environment - will rapidly dissolve and will be present as the molybdate species under normal environmental conditions.
Mobility	Molybdate originating from sodium molybdate anhydrous is soluble in water and with its relatively low Kd value, the molybdate ions are leachable through normal soil and are mobile in sediment. Typical log Kd-values of 3.25 and 2.94 have been determined for sediment and soil, respectively.
Environmental Fate	The product should be prevented from reaching the sewage system or any water course, and from penetrating the ground/soil.
Bioaccumulation Potential	Available information on transfer of molybdenum through the food chain indicates that molybdenum does not biomagnify in aquatic food chains. Although not homeostatically controlled in terrestrial plants and invertebrates, molybdenum is not largely concentrated from soil into plants, or soil to invertebrates. There is no significant concentration increase from diet to mammals or birds. It is concluded that biomagnification is not significant in the terrestrial foodchain.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Waste should be recycled/recovered or disposed of in accordance with local/regional/national regulations.
Special Precautions for Land Fill	No information available.

14. TRANSPORT INFORMATION**Land Transport (Australia)**

ADG Code

Proper Shipping Name	Sodium Molybdate Anhydrous
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Malaysia)

ADR Code

Proper Shipping Name	Sodium Molybdate Anhydrous
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	Sodium Molybdate Anhydrous
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (United States of America)

US DOT

Proper Shipping Name	Sodium Molybdate Anhydrous
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport

IMDG Code

Proper Shipping Name	Sodium Molybdate Anhydrous
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No

Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.
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Air Transport

IATA DGR

Proper Shipping Name	Sodium Molybdate Anhydrous
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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15. REGULATORY INFORMATION

General Information	No Data Available
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Poisons Schedule (Aust)	Not Scheduled
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Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	Not Hazardous
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National/Regional Inventories

Australia (AIIIC)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	231-551-7
Europe (REACH)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (List of Classified Substances)	Not Determined
New Zealand (NZIoC)	Listed

Philippines (PICCS)	Not Determined
Taiwan (TCSI)	Not Determined
USA (TSCA)	Not Determined
Mexico (INSQ)	Not Determined

16. OTHER INFORMATION

Related Product Codes	SOMOLY1200, SOMOLY3300, SOMOLY5100, SOMOLY6000, SOMOLY7200, SOMOLY7900
Revision	4
Revision Date	26 Aug 2021
Reason for Issue	SDS updated
Key/Legend	< Less Than > Greater Than AICS Australian Inventory of Chemical Substances atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm² Square Centimetres CO₂ Carbon Dioxide COD Chemical Oxygen Demand deg C (°C) Degrees Celcius EPA (New Zealand) Environmental Protection Authority of New Zealand deg F (°F) Degrees Farenheit g Grams g/cm³ Grams per Cubic Centimetre g/l Grams per Litre HSNO Hazardous Substance and New Organism IDLH Immediately Dangerous to Life and Health immiscible Liquids are insoluable in each other. inHg Inch of Mercury inH₂O Inch of Water K Kelvin kg Kilogram kg/m³ Kilograms per Cubic Metre lb Pound LC₅₀ LC stands for lethal concentration. LC₅₀ is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. LD₅₀ LD stands for Lethal Dose. LD₅₀ is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals. ltr or L Litre m³ Cubic Metre mbar Millibar mg Milligram mg/24H Milligrams per 24 Hours mg/kg Milligrams per Kilogram mg/m³ Milligrams per Cubic Metre Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present. mm Millimetre mmH₂O Millimetres of Water mPa.s Millipascals per Second N/A Not Applicable NIOSH National Institute for Occupational Safety and Health NOHSC National Occupational Heath and Safety Commission OECD Organisation for Economic Co-operation and Development Oz Ounce PEL Permissible Exposure Limit Pa Pascal

ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight