

Novachem Pty Ltd

Chemwatch Hazard Alert Code: 2

Version No: 1.2 Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements Issue Date: **04/04/2023** Print Date: **04/04/2023** S.GHS.AUS.EN

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

Product Identifier

Product name	Molybdenum ICP-MS Standard
Synonyms	Not Available
Other means of identification	ICP-MS-35W-0.1X-1

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

Relevant identified uses	Laboratory Chemical Reference Material
Relevant luentineu uses	Laboratory Chemical Neicher materia

Details of the manufacturer or supplier of the safety data sheet

Registered company name	Novachem Pty Ltd	Novachem Pty Ltd
Address	25 Crissane Road, Heidelberg West Victoria 3081 Australia	25 Crissane Road, Heidelberg West Victoria 3081 Australia
Telephone	+61384151255	+61384151255
Fax	+61386250088	+61386250088
Website	www.novachem.com.au	www.novachem.com.au
Email	novachem@novachem.com.au	novachem@novachem.com.au

Emergency telephone number

Association / Organisation	Victorian Poisons Information Centre	Victorian Poisons Information Centre
Emergency telephone numbers	13 11 26	13 11 26
Other emergency telephone numbers	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification ^[1]	Not Applicable
Label elements	

Label elements

Hazard pictogram(s)	Not Applicable

Signal word Not Applicable

Hazard statement(s)

Not Applicable

 Precautionary statement(s) Prevention

 Not Applicable

 Precautionary statement(s) Response

 Not Applicable

 Precautionary statement(s) Storage

 Not Applicable

 Precautionary statement(s) Disposal

 Not Applicable

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
12054-85-2	0.184	ammonium molybdate
1336-21-6	<0.001	ammonium hydroxide
7732-18-5	99.815	water
Legend: 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L * EU IOELVs available		

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	 If this product comes in contact with eyes: Wash out immediately with water. If irritation continues, seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs: Immediately remove all contaminated clothing, including footwear. Flush skin and hair with running water (and soap if available). Seek medical attention in event of irritation.
Inhalation	 If fumes, aerosols or combustion products are inhaled remove from contaminated area. Other measures are usually unnecessary.
Ingestion	 Immediately give a glass of water. First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 Firefighting measures

Extinguishing media

There is no restriction on the type of extinguisher which may be used.

Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.
Advice for firefighters	
Fire Fighting	 Alert Fire Brigade and tell them location and nature of hazard. Wear breathing apparatus plus protective gloves in the event of a fire. Prevent, by any means available, spillage from entering drains or water courses. Use fire fighting procedures suitable for surrounding area.
Fire/Explosion Hazard	 Non combustible. Not considered a significant fire risk, however containers may burn. Decomposition may produce toxic fumes of:

SECTION 6 Accidental release measures

HAZCHEM

Personal precautions, protective equipment and emergency procedures

metal oxides

Not Applicable

May emit corrosive fumes.

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	 Clean up all spills immediately. Avoid breathing vapours and contact with skin and eyes. Control personal contact with the substance, by using protective equipment. Contain and absorb spill with sand, earth, inert material or vermiculite.
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Major Spills	Moderate hazard. Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard. Wear breathing apparatus plus protective gloves.
Demonal Distantivo Equipment edu	vice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling	
Safe handling	 Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. DO NOT allow clothing wet with material to stay in contact with skin
Other information	

Conditions for safe storage, including any incompatibilities

Suitable container	 Polyethylene or polypropylene container. Packing as recommended by manufacturer. Check all containers are clearly labelled and free from leaks.
Storage incompatibility	None known

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA							
Source	Ingredient	Material name		TWA	STEL	Peak	Notes
Australia Exposure Standards	ammonium molybdate	Molybdenum, so	oluble compounds (as Mo)	5 mg/m3	Not Available	Not Available	Not Available
Emergency Limits							
Ingredient	TEEL-1		TEEL-2		TEEL-3		
ammonium molybdate	2.6 mg/m3		230 mg/m3		1,400 mg/m3		
ammonium molybdate	2.8 mg/m3		30 mg/m3		180 mg/m3		
ammonium molybdate	3.1 mg/m3		22 mg/m3		130 mg/m3		
ammonium hydroxide	61 ppm		330 ppm		2,300 ppm		
Ingredient	Original IDLH	Original IDLH		Revised IDLH			
ammonium molybdate	1,000 mg/m3	1,000 mg/m3		Not Available			
ammonium hydroxide	Not Available	Not Available		Not Available			
water	Not Available			Not Available			

Occupational Exposure Banding

Occupational Exposure Banding				
Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit		
ammonium hydroxide	E	≤ 0.1 ppm		
Notes:	Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.			

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.
Individual protection measures, such as personal protective equipment	
Eye and face protection	 Safety glasses with side shields. Chemical goggles. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.

Hands/feet protection	 Wear chemical protective gloves, e.g. PVC. Wear safety footwear or safety gumboots, e.g. Rubber NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact. Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed. The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

served when Personal hygiene is a key element of effective hand care. **Body protection** See Other protection below Overalls. P.V.C apron. Other protection Barrier cream. Skin cleansing cream.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computergenerated selection:

N	/101)	/ba	enu	mι	CP	-1015	Star	ndard	1

Material	CPI
BUTYL	А
NEOPRENE	А
HYPALON	С
NATURAL RUBBER	С
NATURAL+NEOPRENE	С
NEOPRENE/NATURAL	С
NITRILE	С
NITRILE+PVC	С
PVA	С
PVC	С
VITON	С

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Clear liquid		
Physical state	Liquid	Relative density (Water = 1)	1.000
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	0	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	100	Molecular weight (g/mol)	Not Available
Flash point (°C)	Not Available	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Available	Oxidising properties	Not Available

Respiratory protection

Type K Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	K-AUS	-	K-PAPR-AUS / Class 1
up to 50 x ES	-	K-AUS / Class 1	-
up to 100 x ES	-	K-2	K-PAPR-2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	2.33	Gas group	Not Available
Solubility in water	Miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	 Unstable in the presence of incompatible materials. Product is considered stable. Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Not normally a hazard due to non-volatile nature of product		
Ingestion	The material has NOT been classified by EC Directives or corroborating animal or human evidence.	other classification systems as "harmful by ingestion". This is because of the lack of	
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.		
Eye	Although the liquid is not thought to be an irritant (as class characterised by tearing or conjunctival redness (as with v	sified by EC Directives), direct contact with the eye may produce transient discomfort windburn).	
Chronic	Skin contact with the material is more likely to cause a set	nsitisation reaction in some persons compared to the general population.	
TOXICITY IRRITATION			
Molybdenum ICP-MS Standard	Not Available	Not Available	
	ΤΟΧΙΟΙΤΥ	IRRITATION	
ammonium molybdate	Oral (Rat) LD50: 333 mg/kg ^[2]	Eye: no adverse effect observed (not irritating) ^[1]	
		Skin: no adverse effect observed (not irritating) ^[1]	
	τοχιςιτγ	IRRITATION	
ammonium hydroxide	Inhalation(Rat) LC50: 2000 ppm4h ^[2]	Eye (rabbit): 0.25 mg SEVERE	
	Oral (Rat) LD50: 350 mg/kg ^[2]	Eye (rabbit): 1 mg/30s SEVERE	
	ΤΟΧΙΟΙΤΥ	IRRITATION	
water	Oral (Rat) LD50: >90000 mg/kg ^[2]	Not Available	
Legend:	1. Value obtained from Europe ECHA Registered Substar specified data extracted from RTECS - Register of Toxic I	nces - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise Effect of chemical Substances	
AMMONIUM MOLYBDATE	For ammonium dimolybdate: (CAS 27546-07-2) Positive r Kligman	eaction in 20% of experimental animals (OECD 406; GPMT according to Magnusoon-	
AMMONIUM HYDROXIDE	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.		
WATER	No significant acute toxicological data identified in literature search.		
Molybdenum ICP-MS Standard & AMMONIUM MOLYBDATE	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria,		

	involve antibody-mediated immune reactions.		
AMMONIUM MOLYBDATE & AMMONIUM HYDROXIDE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.		
Acute Toxicity	×	Carcinogenicity	×
Skin Irritation/Corrosion	×	Reproductivity	×
Serious Eye Damage/Irritation	×	STOT - Single Exposure	×
Respiratory or Skin sensitisation	×	STOT - Repeated Exposure	×
Mutagenicity	×	Aspiration Hazard	×
			not available or does not fill the criteria for classification le to make classification

SECTION 12 Ecological information

	Endpoint	Test Duration (hr)	Species	Value	Source
Molybdenum ICP-MS Standard	Not Available	Not Available	Not Available	Not Available	Not Available
	Endpoint	Test Duration (hr)	Species	Value	Source
ammonium molybdate	LC50	96h	Fish	550mg/l	2
	NOEC(ECx)	2160h	Algae or other aquatic plants	10mg/l	4
	Endpoint	Test Duration (hr)	Species	Value	Source
ammonium hydroxide	LC50	96h	Fish	33.3mg/L	4
	EC50(ECx)	96h	Crustacea	0.83mg/L	5
	Endpoint	Test Duration (hr)	Species	Value	Source
water	Not Available	Not Available	Not Available	Not Available	Not Available
Legend:	Extracted from	1. IUCLID Toxicity Data 2. Europe E0	CHA Registered Substances - Ecotoxicological Informati	on - Aquatic Toxicity 4. l	JS EPA,

For Metal:

Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.

Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities. Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface

Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further.

Persistence and degradability

Ingredient	Persistence: Water/Soil Persistence: Air			
water	LOW LOW			
Discourse of the sector dist.				
Bioaccumulative potential				
Ingredient	Bioaccumulation			
ammonium molybdate	LOW (BCF = 5.7)			
Mobility in soil				
Ingredient	Mobility			
	No Data available for all ingredients			

SECTION 13 Disposal considerations

Waste treatment methods		
Product / Packaging disposal	 Containers may still present a chemical hazard/ danger when empty. Return to supplier for reuse/ recycling if possible. Otherwise: If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. Where possible retain label warnings and SDS and observe all notices pertaining to the product. 	

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:
▶ Reduction
▶ Reuse
▶ Recycling
Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use.
DO NOT allow wash water from cleaning or process equipment to enter drains.
It may be necessary to collect all wash water for treatment before disposal.
In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
Where in doubt contact the responsible authority.
Recycle wherever possible.
Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
 Dispose of by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or incineration in a licensed apparatus (after admixture with suitable combustible material).
Decontaminate empty containers.

SECTION 14 Transport information

Labels Required	
Marine Pollutant	NO
HAZCHEM	Not Applicable

Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
ammonium molybdate	Not Available
ammonium hydroxide	Not Available
water	Not Available

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
ammonium molybdate	Not Available
ammonium hydroxide	Not Available
water	Not Available

Australian Inventory of Industrial Chemicals (AIIC)

SECTION 15 Regulatory information

Safety, health and environmental regulations / legislation specific for the substance or mixture

ammonium molybdate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

ammonium hydroxide is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) -Schedule 6

water is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

National Inventory Status

•			
National Inventory	Status		
Australia - AIIC / Australia Non-Industrial Use	Yes		
Canada - DSL	es		
Canada - NDSL	lo (ammonium molybdate; ammonium hydroxide; water)		
China - IECSC	/es		
Europe - EINEC / ELINCS / NLP	Yes		
Japan - ENCS	Yes		
Korea - KECI	Yes		
New Zealand - NZIoC	Yes		
Philippines - PICCS	Yes		
USA - TSCA	Yes		

National Inventory	Status	
Taiwan - TCSI	Yes	
Mexico - INSQ	Yes	
Vietnam - NCI	Yes	
Russia - FBEPH	Yes	
Legend:	gend: Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.	

SECTION 16 Other information

Revision Date	04/04/2023
Initial Date	04/04/2023

SDS Version Summary

Version	Date of Update	Sections Updated
0.2	04/04/2023	Toxicological information - Acute Health (inhaled), Toxicological information - Acute Health (skin), Toxicological information - Acute Health (swallowed), First Aid measures - Advice to Doctor, Toxicological information - Chronic Health, Hazards identification - Classification, Exposure controls / personal protection - Engineering Control, Ecological Information - Environmental, Exposure controls / personal protection - Exposure Standard, Composition / information on ingredients - Ingredients, Accidental release measures - Spills (major)

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC-TWA: Permissible Concentration-Time Weighted Average PC-STEL: Permissible Concentration-Short Term Exposure Limit IARC: International Agency for Research on Cancel ACGIH: American Conference of Governmental Industrial Hygienists STEL: Short Term Exposure Limit TEEL: Temporary Emergency Exposure Limit。 IDLH: Immediately Dangerous to Life or Health Concentrations ES: Exposure Standard OSF: Odour Safety Factor NOAEL :No Observed Adverse Effect Level LOAEL: Lowest Observed Adverse Effect Level TLV: Threshold Limit Value LOD: Limit Of Detection OTV: Odour Threshold Value BCF: BioConcentration Factors BEI: Biological Exposure Index AIIC: Australian Inventory of Industrial Chemicals DSL: Domestic Substances List NDSL: Non-Domestic Substances List IECSC: Inventory of Existing Chemical Substance in China EINECS: European INventory of Existing Commercial chemical Substances ELINCS: European List of Notified Chemical Substances NLP: No-Longer Polymers ENCS: Existing and New Chemical Substances Inventory KECI: Korea Existing Chemicals Inventory NZIoC: New Zealand Inventory of Chemicals PICCS: Philippine Inventory of Chemicals and Chemical Substances TSCA: Toxic Substances Control Act TCSI: Taiwan Chemical Substance Inventory INSQ: Inventario Nacional de Sustancias Químicas NCI: National Chemical Inventory FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances Powered by AuthorITe, from Chemwatch.