

SAFETY DATA SHEET

GHS
United States
English (US)

Section 1. Identification

Product identifier	MOLYVAN® 822 NT
Product code	29171
Chemical identity	molybdenum, bis (C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes
Other means of identification	Molybdenum dialkyldithiocarbamate in petroleum process oil.
Product type	Liquid.
Material uses	Friction Reducer
Supplier/Manufacturer	Vanderbilt Chemicals, LLC 30 Winfield Street Norwalk, CT 06855 1-203-853-1400
Emergency telephone number	Chemtrec: 1-800-424-9300 Outside US: +1-703-527-3887

Section 2. Hazard(s) identification

OSHA/HCS status	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
Classification of the substance or mixture	Not classified.
GHS label elements	
Signal word	No signal word.
Hazard statements	No known significant effects or critical hazards.
Precautionary statements	
Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.
Hazards not otherwise classified	None known.

Section 3. Composition and ingredient information

Substance/mixture	Mixture
Chemical identity	molybdenum, bis (C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes
Other means of identification	Molybdenum dialkyldithiocarbamate in petroleum process oil.

Ingredient name	CAS number	% by weight
molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes	906665-74-5	50
petroleum process oil, <3.0% DMSO extractable material	64742-52-5	50

Alternate CAS No. 71342-89-7 (Molybdenum, bis(N,N-ditridecylcarbamodithioato)di-m-oxodioxo-di-, sulfurized) also applies.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

The total concentration of ingredients in this product, reported or not in this section, is 100%.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Skin contact	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	No known significant effects or critical hazards.
Inhalation	No known significant effects or critical hazards.
Skin contact	No known significant effects or critical hazards.
Ingestion	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact	No specific data.
Inhalation	No specific data.
Skin contact	No specific data.
Ingestion	No specific data.

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

Notes to physician	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
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Section 4. First aid measures

Specific treatments	No specific treatment.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	None known.

Specific hazards arising from the chemical In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products	Decomposition products may include the following materials: carbon dioxide carbon monoxide metal oxide/oxides
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Special protective actions for fire-fighters Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Dispose of via a licensed waste disposal contractor. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.

Section 6. Accidental release measures

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

This product has a tendency upon standing to exhibit some crystallization or gelling. If this happens, the product may be re-liquified by agitation and heating at 40 to 50°C.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
petroleum process oil, <3.0% DMSO extractable material	OSHA PEL (United States) TWA: 5 mg/m ³ . ACGIH TLV (United States) STEL: 10 mg/m ³ . NIOSH REL (United States, 10/2020) [OIL MIST MINERAL] TWA 10 hours: 5 mg/m ³ . Form: Mist. STEL 15 minutes: 10 mg/m ³ . Form: Mist.

Appropriate engineering controls

Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 8. Exposure controls and personal protection

Eye/face protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. Recommended: splash goggles

Skin protection

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: lab coat

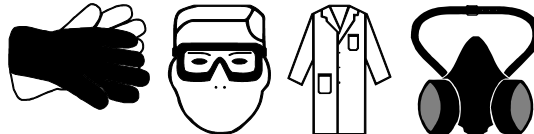
Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: Vapor and dust respirator.

Personal protective equipment (Pictograms)



Section 9. Physical and chemical properties

Appearance

Physical state	Liquid.
Color	Brown.
Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: 160°C (320°F) [Pensky-Martens.]
Burning time	Not applicable.
Burning rate	Not applicable.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	0.0093 kPa (0.07 mm Hg)
Vapor density	Not available.
Density	0.97 g/cm ³ [15.6°C (60.1°F)]
Relative density	0.97
Solubility(ies)	

Section 9. Physical and chemical properties

Media	Result
cold water	Not soluble

Solubility in water	Not available.
Partition coefficient: n-octanol/water	Not applicable.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
SADT	Not available.
Viscosity	Dynamic (room temperature): Not available. Kinematic (room temperature): 651 mm ² /s (651 cSt) [25°C] Kinematic (40°C (104°F)): Not available.

Section 10. Stability and reactivity

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data.
Incompatible materials	No specific data.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes petroleum process oil, <3.0% DMSO extractable material	LD50 Oral	Rat	>2000 mg/kg	-
	LC50 Inhalation Dusts and mists	Rat	2.18 mg/l (Based on tests of similar materials)	4 hours
	LD50 Dermal	Rabbit	>5000 mg/kg (Based on tests of similar materials)	-
	LD50 Oral	Rat	>5000 mg/kg (Based on tests)	-

Section 11. Toxicological information

			of similar materials)	
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Conclusion/Summary

Both molybdenum (insoluble) and oil mist (mineral) are believed to have a low order of toxicity. Molybdenum at high oral dosages has produced weight loss, anorexia, liver and kidney damage in animals but few signs and symptoms in humans have been recorded during normal usage. Oil mists (unless contaminated with endotoxins or high volatile organics) have produced few adverse effects. Mild decrements in lung function, however, have more recently been reported with repeated elevated exposures.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
petroleum process oil, <3.0% DMSO extractable material	Eyes - Not irritant (Based on tests of similar materials)	Rabbit	-	-	-
	Skin - Not irritant (Based on tests of similar materials)	Rabbit	-	-	-

Conclusion/Summary

Skin

molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes: Non-irritating to the skin. (Reconstructed Human Epidermis Test Method)

Eyes

molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes: Non-irritating to the eyes. (Bovine Corneal Opacity and Permeability Test Method)

Sensitization

Product/ingredient name	Route of exposure	Species	Result
molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes	skin	Guinea pig	Not sensitizing
petroleum process oil, <3.0% DMSO extractable material	skin	Guinea pig	Not sensitizing (Based on tests of similar materials)

Mutagenicity

Product/ingredient name	Test	Experiment	Result
molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes	OECD 471	Experiment: In vitro Subject: Bacteria	Negative
	OECD 490	Experiment: In vitro Subject: Mammalian-Animal	Negative
	OECD 487	Experiment: In vitro Subject: Mammalian-Human	Negative
petroleum process oil, <3.0% DMSO extractable material	OECD 471	Experiment: In vitro Subject: Bacteria	Positive (Based on tests of similar materials)
	OECD 474	Experiment: In vivo Subject: Mammalian-Animal	Negative (Based on tests of similar materials)

Section 11. Toxicological information

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Conclusion/Summary

molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes: Oral administration of the test item to parental rats at dose levels of 100, 330 or 1000 mg/kg/day for five weeks to males and for two weeks before pairing, throughout gestation and up to Day 13 of lactation in females was well-tolerated with no adverse effect observed.

Reproductive performance, fertility and offspring survival were unaffected by parental treatment. There was no effect of treatment on the number of implantations, litter size or the growth of the offspring.

In the context of this study, the test item showed no evidence of being an endocrine disruptor. The No-observed-adverse-effect-level (NOAEL) of the test item for systemic toxicity and for reproductive/developmental effects was considered to be 1000 mg/kg/day, the limit dose tested.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure

Routes of entry anticipated: Oral, Inhalation.

Potential acute health effects

Eye contact

No known significant effects or critical hazards.

Inhalation

No known significant effects or critical hazards.

Skin contact

No known significant effects or critical hazards.

Ingestion

May be harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

No specific data.

Inhalation

No specific data.

Skin contact

No specific data.

Ingestion

No specific data.

Section 11. Toxicological information

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Long term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
petroleum process oil, <3.0% DMSO extractable material	Sub-chronic LOAEL Oral	Rat	125 mg/kg (Based on tests of similar materials)	-

Conclusion/Summary molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes: In a study performed to the standardized guidelines OECD 422, the No-observed-adverse-effect-level (NOAEL) of the test item for systemic toxicity effects was considered to be 1000 mg/kg/day.

General No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	5000 mg/kg

Other information

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes	Acute EC50 11 mg/l	Algae	72 hours
petroleum process oil, <3.0% DMSO extractable material	Acute EC50 82 mg/l	Daphnia	48 hours
	Acute EC50 >1000 mg/l	Micro-organism	3 hours
	Acute LC50 >100 mg/l	Fish	96 hours
	Acute EC50 >10000 mg/l (Based on tests of similar materials)	Daphnia	48 hours

Section 12. Ecological information

	Acute LC50 >100 mg/l (Based on tests of similar materials)	Fish	96 hours
	Acute NOEL >100 mg/l (Based on tests of similar materials)	Algae	72 hours
	Acute NOEL >1000 mg/l (Based on tests of similar materials)	Daphnia	48 hours
	Acute NOEL >100 mg/l (Based on tests of similar materials)	Fish	96 hours

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes	OECD 301B	8 % - Not readily - 28 days	-	-
petroleum process oil, <3.0% DMSO extractable material	-	2 to 4 % - Not readily - 28 days (Based on tests of similar materials)	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
molybdenum, bis(C11-14 branched and linear alkyl) carbamodithioate oxo thioxo complexes	-	-	Not readily
petroleum process oil, <3.0% DMSO extractable material	-	-	Not readily (Based on tests of similar materials)

Bioaccumulative potential

Not available.

Mobility in soil

Soil/Water partition coefficient

Not available.

Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
ADR/RID Class	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-
IATA-DGR Class	Not regulated.	-	-	-		-

PG* : Packing group

Section 15. Regulatory information

U.S. Federal regulations

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

TSCA 12(b) - Chemical export notification

Not applicable.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) Not listed

Clean Air Act Section 602 Class I Substances Not listed

Clean Air Act Section 602 Class II Substances Not listed

DEA List I Chemicals (Precursor Chemicals) Not listed

DEA List II Chemicals (Essential Chemicals) Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ Not applicable.

SARA 311/312

Classification Not applicable.

Composition/information on ingredients

No products were found.

State regulations

Massachusetts The following components are listed: OIL MIST, MINERAL

New York None of the components are listed.

New Jersey None of the components are listed.

Pennsylvania None of the components are listed.

California Prop. 65 None of the components are listed.

Section 15. Regulatory information

Inventory list

Alternate CAS No. 71342-89-7 (Molybdenum, bis(N,N-ditridecylcarbamodithioato)di-m-oxodioxo-di-, sulfurized) also applies.

Australia	All components are listed or exempted.
Canada	All components are listed or exempted.
China	All components are listed or exempted.
Japan	All components are listed or exempted.
New Zealand	All components are listed or exempted.
Philippines	All components are listed or exempted.
Republic of Korea	All components are listed or exempted.
Taiwan	All components are listed or exempted.
United States	All components are active or exempted. Alternate CAS No. 71342-89-7 (Molybdenum, bis(N,N-ditridecylcarbamodithioato)di-m-oxodioxo-di-, sulfurized) also applies.

Section 16. Any other relevant information

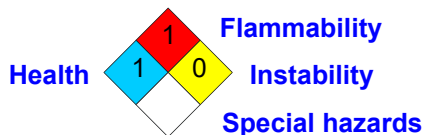
Hazardous Material Information System (U.S.A.)

Health	/	1
Flammability		1
Physical hazards		0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)



History

Date of printing	2/2/2026
Date of issue/Date of revision	2/2/2026
Date of previous issue	6/6/2023
Version	6

Section 16. Any other relevant information

Key to abbreviations

ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References

Not available.

Information contact

Vanderbilt Global Services, LLC
Corporate Risk Management
1-203-295-2143

Visit www.vanderbiltchemicals.com for more information.

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