



Safety Data Sheet

Skyspring Nanomaterials, Inc.

www.ssnano.com

Revision on 09/01/2024

1 Identification of substance:

- **Product details:**
- **Trade name:** Molybdenum Pentachloride
- **Stock number:** 5030CH
- **Manufacturer/Supplier:**
SkySpring Nanomaterials, Inc.
2935 Westhollow Dr., Houston, TX 77082, USA
Phone: 281-870-1700, Fax: 281-870-8002
Email: sales@ssnano.com

2 Hazards identification

- **2.1 Classification of the substance or mixture**

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Skin corrosion (Category 1B), H314

Serious eye damage (Category 1), H318

Carcinogenicity (Category 2), H351

For the full text of the H-Statements mentioned in this Section, see Section 16.

- **2.2 GHS Label elements, including precautionary statements**

Pictogram



Signal Word

Danger

Hazard Statements

H314

Causes severe skin burns and eye damage.

H351

Suspected of causing cancer.

Precautionary Statements

P201

Obtain special instructions before use.

P202

Do not handle until all safety precautions have been read and understood.

P260

Do not breathe dusts or mists

P264

Wash skin thoroughly after handling.

P280

Wear protective gloves/

P301 + P330 + P331	protective clothing/ eye protection/ face protection. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P405	Store locked up
P501	Dispose of contents/ container to an approved waste disposal plant

- **2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none**

3 Composition/Data on components:

- **Chemical characterization:**

Description: (CAS#)

molybdenum pentachloride (CAS# 10241-05-1); <=100%

4 First aid measures

4.1 Description of first-aid measures

No data available

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5 Fire fighting measures

5.1 Extinguishing media

No data available

5.2 Special hazards arising from the substance or mixture

Hydrogen chloride gas

Molybdenum oxides

Not combustible.

5.3 Advice for firefighters

No data available

5.4 Further information

No data available

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For personal protection see section 8.

6.2 Environmental precautions

No data available

6.3 Methods and materials for containment and cleaning up

No data available

6.4 Reference to other sections

For disposal see section 13.

7 Handling and storage

7.1 Precautions for safe handling

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Air and moisture sensitive. Handle and store under inert gas.

Storage class

Storage class (TRGS 510): 8A: Combustible, corrosive hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8 Exposure controls and personal protection

- **Additional information about design of technical systems:**
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Molybdenum and compounds (as Mo)	mg/m ³
ACGIH TLV	5
Austria MAK	15
Belgium TWA	5
Denmark TWA	5
Finland TWA	5
France VME	5
Germany MAK	5
Netherlands MAC-TGG	5
Sweden NGV	10 (total dust) 5 (respirable dust)
Switzerland TWA	5
United Kingdom TWA	10; 20-STEL
USA PEL	5

- **Additional information:** No data
- **Personal protective equipment**
- **General protective and hygienic measures**
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
- **Breathing equipment:**
Use suitable respirator when high concentrations are present.
- **Protection of hands:** Impervious gloves
- **Eye protection:** Safety glasses
- **Body protection:** Protective work clothing.

9 Physical and chemical properties:

- **General Information**

- **Form:** Powder
- **Color:** Dark blue
- **Odor:** Odorless

	<u>Value/Range</u>	<u>Unit</u>	<u>Method</u>
• Change in condition			
• Melting point/Melting range:	194 °C (381 °F) -		lit.
• Boiling point/Boiling range:	268 °C 514 °F -		lit.
• Sublimation temperature / start:	Not determined		
• Flash point:	Not applicable		
• Ignition temperature:	Not determined		
• Decomposition temperature:	Not determined		
• Danger of explosion:	Product does not present an explosion hazard.		
• Explosion limits:			
• Lower:	Not determined		
• Upper:	Not determined		
• Vapor pressure:	175 hPa at 250 °C (482 °F) 2.33 hPa at 25 °C (77 °F)		
• Density:	2.928 g/mL at 25 °C (77 °F) -		lit.
• Solubility in / Miscibility with Water	No data available		

10 Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

No data available

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

Air Avoid moisture.

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

In the event of fire: see section 5

11 Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute toxicity estimate Oral - > 5,000 mg/kg
(Calculation method)

Oral: No data available

Acute toxicity estimate Inhalation - 4 h - 105 mg/l -
dust/mist (Calculation method)

Inhalation: No data available

Acute toxicity estimate Dermal - > 5,000 mg/kg
(Calculation method)

Dermal: No data available

No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans
(molybdenum(VI) oxide)

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater

than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information

Cough, Shortness of breath, Headache, Nausea, Vomiting

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

12 Ecological information:

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

No data available

13 Disposal considerations

13.1 Waste treatment methods

No data available

14 Transport information

DOT (US)

UN number: 2508 Class: 8 Packing group: III
Proper shipping name: Molybdenum pentachloride
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG

UN number: 2508 Class: 8 Packing group: III EMS-No: F-A,S-B
Proper shipping name: MOLYBDENUM PENTACHLORIDE

IATA

UN number: 2508 Class: 8 Packing group: III
Proper shipping name: Molybdenum pentachloride

15 Regulations

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

Components CAS-No. Component TPQ (lbs)

SARA 311/312 : Acute Health Hazard
Hazards : Chronic Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Massachusetts Right To Know

Product does not contain any listed chemicals

Pennsylvania Right To Know

Product does not contain any listed chemicals

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Molybdenum pentachloride 10241-05-1

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The ingredients of this product are reported in the following inventories:

TSCA: All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.