

Molybdenum Sulfide Nanoparticles (MoS<sub>2</sub>)  
**LUOYANG TONGRUN INFO TECHNOLOGY CO., LTD**

Material Safety Data Sheet

Huoju Industrial Park, Yanguang Road, Gaoxin District, Luoyang City, China.

<b>1 Identification of substance</b>
<b>Trade name:</b> Molybdenum sulfide power <b>Manufacturer/Supplier:</b> LUOYANG TONGRUN INFO TECHNOLOGY CO., LTD Huoju Industrial Park, Yanguang Road, Gaoxin District, Luoyang City, China TEL: 0086 0379 6511 2007 Email: sales2@rboschco.com
<b>2 Composition/Data on components</b>
<b>Chemical characterization</b> Molybdenum sulfide power, 99% CAS#: 1317-33-5 EINECS No.: 215-263-9
<b>3 Hazards identification</b>
<b>Hazard description</b> Xi Irritant <b>Information pertaining to particular dangers for man and environment</b> R 36/37/38 Irritating to eyes, respiratory system and skin. <b>Classification system HMIS ratings</b> scale 0-4 <b>Hazardous Materials Identification System</b> Health (acute effects) = 1 Flammability = 0 Reactivity = 1
<b>4 First aid measures</b>
<b>After inhalation</b> Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice. <b>After skin contact</b> Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice. <b>After eye contact</b> Rinse opened eye for several minutes under running water. Then consult a doctor. <b>After swallowing</b> Seek immediate medical advice.

<p><b>5 Fire fighting measures</b></p> <p><b>Suitable extinguishing agents</b> Product is not flammable. Use fire fighting measures that suit the surrounding fire.</p> <p><b>Special hazards caused by the material, its products of combustion or resulting gases</b> In case of fire, the following can be released: Metal oxide fume Sulfur oxides (SO<sub>x</sub>)</p> <p><b>Protective equipment</b> Wear self-contained respirator. Wear fully protective impervious suit.</p>
<p><b>6 Accidental release measures</b></p> <p><b>Person-related safety precautions</b> Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation</p> <p><b>Measures for environmental protection</b> Do not allow material to be released to the environment without proper governmental permits.</p> <p><b>Measures for cleaning/collecting</b> Ensure adequate ventilation.</p> <p><b>Additional information</b> See Section 7 for information on safe handling See Section 8 for information on personal protection equipment. See Section 13 for disposal information.</p>
<p><b>7 Handling and storage</b></p> <p><b>Handling</b></p> <p><b>Information for safe handling</b> Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace.</p> <p><b>Information about protection against explosions and fires</b> The product is not flammable</p> <p><b>Storage</b></p> <p><b>Requirements to be met by storerooms and receptacles</b> No special requirements.</p> <p><b>Information about storage in one common storage facility</b> Store away from oxidizing agents.</p> <p><b>Further information about storage conditions</b> Keep container tightly sealed. Store in cool, dry conditions in well sealed containers.</p>
<p><b>8 Exposure controls and personal protection</b></p> <p><b>Additional information about design of technical systems</b> Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.</p>

**Components with limit values that require monitoring at the workplace**

		mg/m <sup>3</sup>
Molybdenum and compounds (as Mo)		
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 and skin.

**Breathing equipment**

Use suitable respirator when high concentrations are present.

**Protection of hands**

Impervious gloves

Check protective gloves prior to each use for their proper condition.

**Material of gloves**

The selection of suitable gloves not only depends on the material, but also on quality.

Quality will vary from manufacturer to manufacturer.

**Eye protection**

Safety glasses

**Body protection**

Protective work clothing.

**9 Physical and chemical properties****General Information**

Form: Powder

Color: Black

Odor: Odorless

Value/Range	Unit	Method
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**Change in condition**

<p><b>Melting point/Melting range:</b> 1185 ° C</p> <p><b>Boiling point/Boiling range:</b> Not determined</p> <p><b>Sublimation temperature / start:</b> Not determined</p> <p><b>Flash point:</b> Not applicable</p> <p><b>Ignition temperature:</b> Not determined</p> <p><b>Decomposition temperature:</b> Not determined</p> <p><b>Danger of explosion:</b> Product does not present an explosion hazard.</p> <p><b>Explosion limits:</b></p> <p><b>Lower:</b> Not determined</p> <p><b>Upper:</b> Not determined</p> <p><b>Vapor pressure:</b> Not determined</p> <p><b>Density:</b> at 20 ° C 4.80 g/cm<sup>3</sup></p> <p><b>Solubility in / Miscibility with</b></p> <p><b>Water:</b> Insoluble</p>
<p><b>10 Stability and reactivity</b></p> <p><b>Thermal decomposition / conditions to be avoided:</b> Decomposition will not occur if used and stored according to specifications.</p> <p><b>Materials to be avoided:</b> Oxidizing agents</p> <p><b>Dangerous reactions</b> No dangerous reactions known</p> <p><b>Dangerous products of decomposition:</b> Metal oxide fume Sulfur oxides (SOx)</p>
<p><b>11 Toxicological information</b></p> <p><b>Acute toxicity:</b></p> <p><b>LD/LC50 values that are relevant for classification:</b> Oral: LD: &gt;2 gm/kg (rat) Dermal: LD: &gt;2000 mg/kg (rat) Inhalative: LC50/4H: &gt;2820 mg/m<sup>3</sup>/4H (rat)</p> <p><b>Primary irritant effect:</b> <b>on the skin:</b> Irritant to skin and mucous membranes. <b>on the eye:</b> Irritating effect.</p> <p><b>Sensitization:</b> No sensitizing effects known.</p> <p><b>Subacute to chronic toxicity:</b> Acute molybdenum poisoning may cause severe gastrointestinal irritation, diarrhea, coma and death from cardiac failure. Chronic molybdenum poisoning in laboratory animals has caused loss of weight, anorexia, anemia, deficient lactation, male sterility, osteoporosis and bone joint abnormalities.</p> <p><b>Subacute to chronic toxicity:</b> The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals: Skin and Appendages - hair. Skin and Appendages - dermatitis, other (after systemic exposure). Nutritional and Gross Metabolic - weight loss or decreased weight</p>

<p>gain.</p> <p>Lungs, Thorax, or Respiration - other changes.</p> <p><b>Subacute to chronic toxicity:</b></p> <p>Sulfides show variable toxicity. The alkaline sulfides are similar in action to alkalis. They cause irritation of the skin and are corrosive by ingestion. The heavy metal sulfides are generally insoluble and show little toxic action except through the liberation of hydrogen sulfide. Hydrogen sulfide, if generated, is toxic, a severe irritant and flammable. Effects include conjunctivitis, headache, nausea, dizziness, coughing, pulmonary edema and possibly death.</p> <p><b>Additional toxicological information:</b></p> <p>To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.</p> <p>No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.</p>
<p><b>12 Ecological information</b></p>
<p><b>General notes</b></p> <p>Do not allow material to be released to the environment without proper governmental permits.</p>
<p><b>13 Disposal considerations</b></p>
<p><b>Product Recommendation</b></p> <p>Consult state, local or national regulations to ensure proper disposal.</p> <p><b>Uncleaned packagings Recommendation</b></p> <p>Disposal must be made according to official regulations.</p>
<p><b>14 Transport information</b></p>
<p><b>Not a hazardous material for transportation.</b></p> <p><b>DOT regulations</b></p> <p><b>Hazard class:</b> None</p> <p><b>Land transport ADR/RID (cross-border)</b></p> <p><b>ADR/RID class:</b> None</p> <p><b>Maritime transport IMDG:</b></p> <p><b>IMDG Class:</b> None</p> <p><b>Air transport ICAO-TI and IATA-DGR:</b></p> <p><b>ICAO/IATA Class:</b> None</p> <p><b>Transport/Additional information:</b></p> <p>Not dangerous according to the above specifications</p>
<p><b>15 Regulations</b></p>
<p><b>Product related hazard informations:</b></p> <p><b>Hazard symbols:</b> Xi Irritant</p> <p><b>Risk phrases:</b></p> <p>36/37/38 Irritating to eyes, respiratory system and skin.</p> <p><b>Safety phrases:</b></p>

26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

37 Wear suitable gloves.

**Information about limitation of use:**

For use only by technically qualified individuals.

**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.

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