

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name: Molsiv Adsorbents 13X 1/8

Product Use: Adsorbent

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Emergency Assistance - 24 hour Emergency Telephone Numbers:

USA (UOP LLC) : + 1-847-391-2123
 USA (CHEMTREC) : + 1-800-424-9300
 Canada (CANUTEC) : + 1-613-996-6666
 Outside USA (CHEMTREC) : + 1-703-527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT & CAS No</u>	<u>% WEIGHT</u>	<u>ACGIH TLV-TWA</u>	<u>OSHA PEL-TWA</u>	<u>UNITS</u>
Silicon oxide (synthetic) 7631-86-9	< 65	10(I) 3(R)	15(TD) 5(R)	mg/m ³
Aluminum oxide (non-fibrous) 1344-28-1	< 35	10	15(TD) 5(R)	mg/m ³
Sodium oxide 1313-59-3	< 20	N.E.	N.E.	N.A.
Magnesium oxide 1309-48-4	< 5	10 as Fu	15 as Fu (Total Particulate)	mg/m ³
Quartz 14808-60-7	< 2	0.05 (R)	TD: 30/(%SiO ₂ +2) RD: 10/(%SiO ₂ +2)	mg/m ³

Note: The OSHA Permissible Exposure Limits (PEL) are determined from the percentage of quartz from airborne samples.

Abbreviations:

N.A.	- Not Applicable	RD	- Respirable Dust	Fu	- Fume	IS	- Insoluble
N.E.	- None Established	TD	- Total Dust	I	- Inhalable		
SC	- Soluble Compounds	FuD	- Fume and Dust	R	- Respirable		

3. HAZARDS IDENTIFICATION

Emergency Overview

In the fresh unused state, this product is not flammable. When first wetted, the product can heat up to the boiling point of water. Flood with water to cool material. Repeated and prolonged inhalation of crystalline silica in the form of quartz from occupational sources may cause cancer.

Form: Pellets

Color: Tan

Potential Health Effects:

Primary Routes of Exposure:	Contact with skin and eyes. Exposure may also occur via inhalation or ingestion if product dust is generated.
Skin Contact:	May cause skin irritation. The product gets hot as it first adsorbs water.
Eye Contact:	Dust and /or product may cause eye discomfort and/or irritation seen as tearing and reddening.
Ingestion:	The product gets hot as it first adsorbs water. Burns to moist body tissues can result if contact is prolonged.
Inhalation:	Exposure to dust particles generated from this material may cause irritation of the respiratory tract. Repeated and prolonged inhalation of crystalline silica in the form of quartz from occupational sources may cause cancer.
Target Organ:	Prolonged or repeated inhalation may cause lung injury/cancer.

Carcinogenicity Classification:

International Agency for Research on Cancer (IARC):

Silicon oxide (synthetic) - Unclassifiable as to carcinogenicity in humans (Group 3).

Inhaled crystalline silica in the form of quartz from occupational sources is carcinogenic to humans (Group 1).

U.S. National Toxicology Program (NTP):

Quartz - Known human carcinogen.

U.S. Occupational Safety and Health Administration (OSHA):

Quartz - Known Carcinogen.

American Conference of Governmental Industrial Hygienists (ACGIH):

Aluminum oxide - Not Classifiable as a Human Carcinogen (A4).

Quartz - Suspected Human Carcinogen (A2)

4. FIRST AID MEASURES

- 4.1 Eye contact:** Flush immediately with plenty of water for at least 15 minutes. If eye irritation persists, consult a physician.
- 4.2 Skin contact:** Wash off with soap and plenty of water. If skin irritation persists, call a physician.
- 4.3 After inhalation:** Remove the victim into fresh air. If symptoms persist, call a physician.
- 4.4 After ingestion:** Immediately give large volume of water to drink. If symptoms persist, call a physician.
- 4.5 Notes to physician:** This product is a desiccant and generates heat as it adsorbs water. The used product can contain material of a hazardous nature. Identify that material and treat symptomatically.

5. FIRE FIGHTING MEASURES

- 5.1 Suitable extinguishing media:** Non-combustible. Use extinguishing media for surrounding fire.
- 5.2 Unsuitable extinguishing media:** N.A.
- 5.3 Fire and explosion hazards:** The product itself does not burn. The used product can retain material of a hazardous nature.
Identify that material and inform the fire fighters.
- 5.4 Special protective equipment:** In the case of respirable dust and/or fumes, use self-contained breathing apparatus and dust impervious protective suit.
- 5.5 Flash Point:** N.A.

6. ACCIDENTAL RELEASE MEASURES

- 6.1 Personal protection:** See 8.2
- 6.2 Environmental precautions:** No special environmental precautions required.
- 6.3 Clean-up:** Sweep, shovel or vacuum spilled product into appropriate containers (do not use a vacuum if material has contacted a hydrocarbon material). Pick-up and arrange disposal without creating dust. Never use spilled product.
Spilled product should be disposed of in accordance with all applicable government regulations.

7. HANDLING AND STORAGE

- 7.1 Handling:** Handle and open container with care. Avoid formation of dust particles. Avoid contact with skin and eyes. Provide an electrical ground connection during loading and transfer operations to avoid static discharge in an explosive atmosphere and to prevent persons handling the product from receiving static shocks. A copy of UOP's booklet, "Precautions and Safe Practices for Handling Molecular Sieves in Process Units", M-100C, can be obtained from your UOP representative at no cost.
- 7.2 Storage:** Store in original container. Keep in a dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1 Engineering measures:** Ensure adequate ventilation, especially in confined areas.
- 8.2 Personal protection equipment:** Handle in accordance with good industrial hygiene and safety practice.
- Eye protection:** Safety glasses or goggles.
- Hand protection:** Protective gloves.
- Skin and body protection:** Work uniform and gloves to prevent prolonged contact.
- Respiratory protection:** In case of insufficient ventilation wear suitable respiratory equipment.
Breathing apparatus with filter: NIOSH classification N-100 or if oil/liquid aerosols are present P-100 (42 CFR 84).

9. PHYSICAL AND CHEMICAL PROPERTIES

These data do not represent technical or sales specifications.

9.1 Form:	Pellets
9.2 Color:	Tan
9.3 Odor:	None
9.4 pH:	N.A.
9.5 Boiling point/range:	N.A.
9.6 Melting point/range:	N.A.
9.7 Flash point:	N.A.
9.8 Autoignition temperature:	N.A.
9.9 Bulk density:	N.D.
9.10 Explosion limits:	N.A.
9.11 Vapor pressure:	N.A.
9.12 Relative density/Specific Gravity:	N.A.
9.13 Vapor density:	N.A.
9.14 Viscosity:	N.A.
9.15 Water solubility:	N.D.
9.16 Solubility:	N.D.

Abbreviations:

AS	- Aqueous slurry
N.D.	- Not Determined
N.A.	- Not Applicable

10. STABILITY

10.1 Stability:	Stable.
10.2 Hazardous decomposition products:	No decomposition if used as directed. Hydrocarbons and other materials that contact the product during normal use can be retained on the product. It is reasonable to expect that decomposition products will come from these retained materials of use.
10.3 Conditions/Materials to avoid:	Sudden contact with high concentrations of chemicals having high heats of adsorption such as olefins, HCl, etc. When first wetted, the product can heat up to the boiling point of water. Flood with water to cool material.

11. TOXICOLOGICAL INFORMATION

11.1 Acute toxicity:

LD50/oral/rat = > 32 000 mg/kg *

LD50/dermal/rabbit = > 2 000 mg/kg *

LC50/inhalation/rat = No data available.

11.2 Chronic toxicity:

Classification of Ingredients

EC Carcinogenic: Not listed.

EC Mutagenic: Not listed.

EC Toxic for Reproduction: Not listed.

Carcinogenicity (ACGIH): A4 (Aluminum oxide)
A2 (Quartz)

IARC classification: Group 3 (Silicon oxide - synthetic)
Group 1 (Quartz)

11.3 Routes of exposure:

Exposure may occur via inhalation, contact with skin and eyes.

11.4 Irritation:

Skin (rabbit): Not classified as a skin irritant in animal testing. *

Eye (rabbit): Moderate eye irritation. *

11.5 Additional product information:

* The toxicological data has been taken from products of similar composition.

11.6 Additional component information:

No data available.

12. ECOLOGICAL INFORMATION

12.1 Mobility:	No data available.
12.2 Biodegradation:	No data available.
12.3 Bioaccumulation:	No data available.
12.4 Aquatic toxicity:	No data available.
12.5 Further Information:	No information available.

13. DISPOSAL CONSIDERATIONS

13.1 Provisions relating to waste:	EPA - Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Management Regulations.
13.2 Disposal information:	This product (in its fresh unused state) is not listed by generic name or trademark name in the U.S. EPA's RCRA regulations and does not possess any of the four identifying characteristics of hazardous waste (ignitability, corrosivity, reactivity or toxicity). Materials of a hazardous nature that contact the product during normal use may be retained on this product. The user of the product must identify the hazards associated with the retained material in order to assess the waste disposal options.

14. TRANSPORT INFORMATION

14.1 Proper shipping name:	Not applicable.
14.2 UN-No.:	N.A.
Packing group:	N.A.
14.3 U.S. DOT	Not regulated.
DOT Shipping name:	N.A.
Hazard classification	N.A.
14.4 IMO:	Not regulated.
EmS:	N.A.
MFAG:	N.A.
Marine pollutant:	No
14.5 ICAO - IATA:	Not regulated.
Instruction "passenger":	N.A.
Instruction "cargo":	N.A.
14.6 Further Information:	
Not classified as hazardous or dangerous in the meaning of transport regulations.	

15. REGULATORY INFORMATION

United States

Toxic Substances Control Act (TSCA):

All the ingredients of this mixture are registered on the TSCA Chemical Substance Inventory.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) Reportable Quantity:

The following component(s) of this product is/are subject to release reporting under 40 CFR 302 when release exceeds the Reportable Quantity (RQ):

-- None --

SARA Title III (Superfund Amendments and Reauthorization Act of 1986):

Section 302 (Extremely Hazardous Substances):

The following component(s) of this product is/are subject to the emergency planning provisions of 40 CFR 355 when there are amounts equal to or greater than the Threshold Planning Quantity (TPQ):

-- None --

Section 313 (Toxic Chemicals):

The following component(s) have been specified as Toxic Chemicals under SARA Section 313 and may be subject to the Toxic Release Inventory (TRI) reporting requirements under 40 CFR 372:

-- None --

The following components are listed in U.S. State Regulations:

<u>State Reg Reference:</u>	<u>Component(s)</u>
California - Proposition 65:	Silica, crystalline
Massachusetts Right-To-Know:	Aluminum oxide Quartz
New Jersey Right-To-Know:	Silica, amorphous Aluminum oxide Magnesium oxide Silica, quartz
Pennsylvania Right-To-Know:	Silica Aluminum oxide Magnesium oxide Quartz

Note: Other U.S. State Regulations may exist, check your local sources if available or contact the UOP Product Stewardship Manager (see Section 16).

Canada

Canadian Hazardous Products Act:

This product is classified as a material causing other toxic effects, carcinogenicity - Class D, Division 2, Subdivision A, under regulations pursuant to the Federal Hazardous Products Act (e.g. WHMIS)

Canadian Environmental Protection Act:

All the ingredients of this mixture are notified to CEPA and on the DSL (Domestic Substances List).

European Union (EU)

European Inventory of Existing Commercial Chemical Substances:

All components of this product are included in EINECS/ELINCS.

Council of European Communities Directive on Classification, Packaging and Labelling of Dangerous Substances/Preparation (67/548/EEC & 88/379/EEC):

No Dangerous Goods Label Required.