



MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name: Molsiv Adsorbents 13X 8x12

Product Use: Adsorbent

UOP LLC
25 E. Algonquin Road
Des Plaines, IL 60017-5017
USA
Tel: +1-847-391-2000
Fax: +1-847-391-2953

UOP CH Sàrl
Z.A. La Pièce 16
1180 Rolle
Switzerland
Tel: +41-21-6953039
Fax: +41-21-6953189

UOP N.V.
Noorderlaan 147
B-2030 Antwerp
Belgium
Tel: +32-3-5409-971
Fax: +32-3-5417-806

Emergency Assistance - 24 hour Emergency Telephone Numbers:

Medical (PROSAR) : + 1-800-498-5701 or + 1-651-523-0309
Transportation or other emergencies (CHEMTREC) : + 1-800-424-9300 or + 1-703-527-3887

2. HAZARDS IDENTIFICATION

Emergency Overview:

Repeated or prolonged exposure may irritate eyes, skin and respiratory system. 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: Beads
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.

Eye Contact: Dust and /or product may cause eye discomfort and/or irritation seen as tearing and reddening.

Skin Contact: May cause skin irritation. The product gets hot as it first adsorbs water.

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.

Chronic Effects: 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 to be a 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)

3. 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 | < 60 | N.E. | 15(TD) 5(R) | mg/m ³ |
| Aluminum oxide (non-fibrous) 1344-28-1 | < 40 | 1(R) | 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 (I) | 15 (Total Particulate) | mg/m ³ |
| Quartz 14808-60-7 | < 5 | 0.025(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 | R | - Respirable Fraction | I | - Inhalable | FuD | - Fume and Dust |
| STEL | - Short Term Exposure Limit | F | - Respirable Fibers | TD | - Total Dust | SC | - Soluble Compounds |

4. FIRST AID MEASURES

Eye contact: Flush immediately with plenty of water for at least 15 minutes. If eye irritation persists, consult a physician.

Skin contact: Wash off with soap and plenty of water. If skin irritation persists, call a physician.

After inhalation: Remove the victim into fresh air. If symptoms persist, call a physician.

After ingestion: Drink at least 2 glasses of water. Obtain medical attention. Never give anything by mouth to an unconscious person.

Notes to physician: This product is a desiccant and generates heat as it adsorbs water. The used product can retain material of a hazardous nature. Identify that material and treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Non-combustible. Use extinguishing media for surrounding fire.

Unsuitable extinguishing media: N.A.

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.

Special protective equipment: In the case of respirable dust and/or fumes, use self-contained breathing apparatus and dust impervious protective suit.

Flash Point: N.A.

6. ACCIDENTAL RELEASE MEASURES

Personal protection: See Section 8.

Environmental precautions: No special environmental precautions required.

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

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 Zeolite Molecular Sieve Adsorbents in Process Units", can be obtained from your UOP representative at no cost.

Storage: Store in original container. Keep in a dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures: Where natural ventilation is inadequate, especially in confined areas, use mechanical ventilation, other engineering controls or respiratory protection to prevent inhalation of product dust.

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. Air-purifying respirator with NIOSH classification N-100 filter or P-100 (or equivalent) if oil/liquid aerosols are present (42 CFR 84).

9. PHYSICAL AND CHEMICAL PROPERTIES

These data do not represent technical or sales specifications.

Form: Beads

Color: Tan

Odor: None

pH: N.A.

Boiling point/range: N.A.

Melting point/range: N.A.

Flash point: N.A.

Autoignition temperature: N.A.

Bulk density: N.D.

Explosion limits: N.A.

Vapor pressure: N.A.

Relative density/Specific Gravity: N.A.

Vapor density: N.A.

Viscosity: N.A.

Water solubility: N.D.

Solubility: N.D.

Abbreviations:

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

10. STABILITY

Stability: Stable.

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.

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

Acute toxicity:

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

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

LC50/inhalation/rat: No data available.

Chronic toxicity: Classification of Ingredients

EC Carcinogenic:

Not listed.

Carcinogenicity (ACGIH):

A4 (Aluminum oxide)

A2 (Quartz)

EC Mutagenic:

Not listed.

IARC classification:

Group 3 (Silicon oxide - synthetic)

Group 1 (Quartz)

EC Toxic for Reproduction:

Not listed.

Routes of exposure: Exposure may occur via inhalation, contact with skin and eyes.

Irritation:

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

Eye (rabbit): Mild eye irritation. *

Additional product information:

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

Additional component information:

No data available.

12. ECOLOGICAL INFORMATION

Mobility:

No data available.

Biodegradation:

No data available.

Bioaccumulation:

No data available.

Aquatic toxicity:

No data available.

Further Information:

No information available.

13. DISPOSAL CONSIDERATIONS

Provisions relating to waste: EPA - Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Management Regulations.

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

UN-No.:

N.A.

Proper shipping name:

Not applicable.

Packing group:

N.A.

| <u>Transport Mode</u> | <u>Class</u> | <u>Additional Information</u> | | <u>Remarks</u> |
|-----------------------|----------------|-------------------------------|------|----------------|
| U.S. DOT: | Not regulated. | Reportable Quantity: | N.A. | N.A. |
| | | Marine Pollutant DOT: | No | |
| ADR/RID: | Not regulated. | Danger Code: | N.A. | N.A. |
| IMDG: | Not regulated. | Marine pollutant: | No | N.A. |
| | | EmS: | N.A. | |
| IATA: | Not regulated. | | | N.A. |

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:

State Reg Reference:

State Reg Reference:

California - Proposition 65:

Silica, crystalline

Massachusetts Right-To-Know:

Amorphous silica
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.

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 & 1999/45/EC, as amended):

No Dangerous Goods Label Required.

Additional Governmental Inventories

Australia - Inventory of Chemical Substances (AICS): All the ingredients of this mixture appear on the AICS.

China: All the ingredients of this mixture appear on the China Inventory.

Japan - Existing and New Chemical Substances (ENCS): All the ingredients of this mixture appear on the ENCS.

Korea - Existing and Evaluated Chemical Substances (ECL): All the ingredients of this mixture appear on the ECL.

Philippines - Inventory of Chemicals and Chemical Substances (PICCS): All the ingredients of this mixture appear on the PICCS.

16. OTHER INFORMATION

Summary of changes: Sections 1, 3, 16
Supersedes: June 2008
Prepared by: UOP Health, Safety & Environmental Department

HMIS™ - Hazardous Material Identification System:

HMIS™ Ratings: 0-minimal hazard, 1- slight hazard, 2- moderate hazard, 3- serious hazard, 4- severe hazard.

HEALTH : 1* - * may cause cancer
FLAMMABILITY : 0
REACTIVITY : 1

For additional information concerning this product, contact the following:

For health, safety and environmental information, please contact:

Product Stewardship Manager
UOP LLC
25 E. Algonquin Road
Des Plaines, IL 60017-5017
USA
Tel: +1-847-391-3095
Fax: +1-847-391-2953

Product Stewardship Europe
UOP N.V.
Noorderlaan 147
B-2030 Antwerpen
Belgium
Tel: +32-3-5409-971
Fax: +32-3-5417-806

For technical or purchasing information, please contact:

Adsorbent Sales
UOP - Molsiv Dept.
13105 Northwest Freeway
Suite 600
Houston, TX 77040
USA
Tel: +1-713-744-2811
Fax: +1-713-744-2808

PRODUCT EMERGENCIES

If you have a product-related emergency, resulting in an incident such as a spill or release of product or human exposure and need assistance from UOP, please contact the following number:

**24-Hour EMERGENCY NUMBER (CHEMTREC) : +1-800-424-9300 or +1-703-527-3887;
for MEDICAL EMERGENCY (PROSAR): +1-800-498-5701 or +1-651-523-0309**

The data and recommendations presented in this data sheet concerning the use of our product and the materials contained therein are believed to be accurate and are based on information which is considered reliable as of the date hereof. However, the customer should determine the suitability of such materials for his purpose before adopting them on a commercial scale. Since the use of our products by others is beyond our control, no guarantee, express or implied, is made and no responsibility assumed for the use of this material or the results to be obtained therefrom. Information on this form is furnished for the purpose of compliance with Government Health and Safety Regulations and shall not be used for any other purposes. Moreover, the recommendations contained in this data sheet are not to be construed as a license to operate under, or a recommendation to infringe, any existing patents, nor should they be confused with state, municipal or insurance requirements, or with national safety codes.