Material Safety Data Sheet

Product Name: **MS-1 Desiccant (Silicate)**
Product Part Number: **1730-5, 1735-5**

Common Name:	Molecular Sieve Type 4A
Chemical Name:	Sodium aluminosilicate
Chemical Formula:	Na_2O, AL_2O_3, SiO_2, MgO
Manufacturer:	UOP Inc, Molecular Sieve Division
Distributor:	King Engineering Corporation
UOP Emergency Phone Number:	847-391-2123
MSDS:	M-4502-E (attached)

The information herein is provided in good faith, but no warranty, either expressed or implied, is made by King Engineering.

MATERIAL SAFETY DATA SHEET

An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200, available from OSHA regional or area offices.

Do Not Duplicate This Form. Request an Original.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: Molecular Sieve Type 4A

CHEMICAL NAME:	Sodium Aluminosilicate	**SYNONYMS:**	Zeolite
FORMULA:	Na_20, AL_2O_3, SiO_2, MgO	**CHEMICAL FAMILY:**	Molecular Sieve
		MOLECULAR WEIGHT:	Not Applicable

TRADE NAME: UOP® Molecular Sieve; formerly UNION CARBIDE® Molecular Sieve

EMERGENCY PHONE NUMBER

In USA: UOP 847-391-2123 CHEMTREC 800-424-9300
In Canada: CANUTEC 613-996-6666 **From other Countries:** CHEMTREC 01-202-483-7616
For routine information contact your local supplier

GENERAL OFFICES:

IN THE USA:
UOP
Molecular Sieve Division
25 East Algonquin Road
Des Plaines, IL 60017-5017

IN CANADA:
UOP Canada, Inc.
Molecular Sieve Division
120 Eglington Ave. East Suite 304
Toronto, Ontario M4P 1E2

Other offices in principal cities all over the world.

2. COMPOSITION/INFORMATION ON INGREDIENTS

A complex of elements and compounds composed of material shown below.
NOTE: In the table below, the symbol " < " means "less than."

MATERIAL (CAS/TSCA NO.)	Wt (%)	1992-1993 ACGIH TLV—TWA (OSHA-PEL)	
Sodium Oxide (1313-59-3)	<30	None established	(None established)
Aluminum Oxide (1344-28-1) (non-fibrous)	<30	10 mg/m³ as Al	(10 mg/m³ Total dust) (5 mg/m³ Respirable fraction)
Silicon Oxide (7631-86-9)	<50	10 mg/m³	(6 mg/m³)
Magnesium Oxide (1309-48-4)	< 5	10 mg/m³ Fume	(10 mg/m³ Fume Total dust) (5 mg/m³ Respirable fraction)

UOP urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS. To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request such customers to notify their employees, customers, and other users of the product of this information.

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UOP CANADA INC.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR: Product is in the form of tan pellets, TRISIV granules (i.e. mesh), beads or white powder or cake; odorless.

UNUSUAL FIRE AND EXPLOSION HAZARDS: In their fresh unused state, molecular sieves are not flammable. When exposed to water, however, they can get quite hot. When first wetted they can heat to the boiling point of water. Flooding will reduce the temperature to safe limits.

POTENTIAL HEALTH EFFECTS

THRESHOLD LIMIT VALUE: See Section 2.

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING — The product gets hot as it adsorbs water. Burns to moist body tissues can result if contact is prolonged. No other evidence of adverse effects from available information.

SKIN ABSORPTION — No evidence of adverse effects from available information.

INHALATION — May cause irritation of the nose and throat, accompanied by cough and chest discomfort.

SKIN CONTACT — May cause irritation seen as local redness, and/or burns.

EYE CONTACT — May cause discomfort and/or irritation seen as excess redness of the conjunctiva.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: Prolonged inhalation may cause lung damage.

OTHER EFFECTS OF OVEREXPOSURE: None currently known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Breathing of dust may aggravate asthma and inflammatory or fibrotic pulmonary disease.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

CARCINOGENIC ASSESSMENT (NTP ANNUAL REPORT, IARC MONOGRAPHS, OTHERS): None currently known.

4. FIRST AID MEASURES

SWALLOWING — If ingested in large quantities, drink 2 glasses of water. Contact physician for permission to induce vomiting.

SKIN CONTACT — Wash contacted area with soap and water.

INHALATION — Remove the person to fresh air.

EYE CONTACT — Flush eyes with plenty of water for 15 minutes.

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

FLASH POINT (Test Method):	Does not burn	**AUTOIGNITION TEMPERATURE:**	Not applicable

FLAMMABLE LIMITS IN AIR, (vol %)	**LOWER:** Not applicable	**UPPER:**	Not applicable

EXTINGUISHING MEDIA: Unused material will not burn. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Depends on the use of the material. Used material may contain products of a hazardous nature. The user of this product must identify the hazards of the retained material and inform the fire fighters of these hazards.

6. ACCIDENTAL RELEASE MEASURES/SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Sweep the spill area. Collect and place the spilled material in a waste disposal container. Avoid raising dust.

7. HANDLING AND STORAGE

LABEL:
CAUTION
DUST MAY IRRITATE EYES, NOSE, THROAT AND SKIN.
Avoid breathing dust.
Avoid contact with eyes and skin.
Open container slowly.
Use with adequate ventilation.
Do not put in mouth or pour liquid into product. Burns can result.

BEFORE HANDLING OR USING, READ AND UNDERSTAND CURRENT MATERIAL SAFETY DATA SHEET FOR THIS MATERIAL AND, WHEN APPROPRIATE, ALSO READ SAFETY BOOKLET M-1001.

FIRST AID—EYE CONTACT: Immediately flush with water for at least 15 minutes. Call a physician if irritation persists. **SWALLOWING:** Give two or more glasses of water. **INHALED:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. **SKIN CONTACT:** Flush with plenty of water.

pH range if in aqueous slurry 8 to 11.
Designers of processes and fabricators of equipment should read UOP's free booklet, "Precautions and Safe Practices for Handling Molecular Sieves in Process Units," M-1001. Request a copy from your UOP representative.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: A NIOSH/MSHA approved respirator for protection against dust, mist and vapor is recommended for operations when the permissible exposure limit might be exceeded.

VENTILATION	**LOCAL EXHAUST** — Local exhaust ventilation is recommended for operations where the permissible exposure limit might be exceeded.
	MECHANICAL (general) — Not applicable — See Local Exhaust.
	SPECIAL — Not applicable — See Local Exhaust.
	OTHER — Not applicable — See Local Exhaust

PROTECTIVE GLOVES: Use gloves to avoid PROLONGED skin contact.

EYE PROTECTION: Safety glasses or goggles selected as per OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Select in accordance with OSHA 1910.132 and 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT, 760 mm. Hg:	Not applicable	**FREEZING POINT:**	Not applicable
SPECIFIC GRAVITY (H_2O = 1):	1.1 (piece), 2.1 (crystal)	**VAPOR PRESSURE @ 20°C:**	Not applicable
VAPOR DENSITY (air = 1):	Not applicable	**SOLUBILITY IN H_2O, (wt %):**	Not applicable
PERCENT VOLATILES (volume):	Not applicable	**EVAPORATION RATE (Butyl Acetate = 1):**	Not applicable

10. STABILITY AND REACTIVITY

STABILITY	
UNSTABLE	**STABLE**
	X

CONDITIONS TO AVOID: The addition of moisture (water) without flooding can cause rise in temperature from heat of adsorption, and contact with skin might result in burns.

INCOMPATIBILITY (Materials to Avoid): Sudden contact with high concentrations of chemicals having high heats of adsorption such as olefins, HCl, etc.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrocarbons and other materials that contact the molecular sieve during normal use can be retained on the sieve. It is reasonable to expect that decomposition products will come from these retained materials of use. The molecular sieve itself does not readily decompose unless subjected to extreme temperature or chemical conditions. If such decomposition did occur the products would include the mix of oxides listed in Section 2.

HAZARDOUS POLYMERIZATION	
May Occur	**Will not Occur**
	X

CONDITIONS TO AVOID: None currently known.

11. TOXICOLOGICAL INFORMATION

Type 4A has an extremely low order of toxicity by swallowing. The pellets were pulverized and suspended in semi-solid agar for ease of administration.

When the Molecular Sieve was administered by stomach intubation to male rats, the animals survived single massive doses equivalent to 32.0 g per kilogram of body weight with good weight gains. There were no significant micropathological findings on tissue taken fourteen days after dosing.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: None expected.

WATERFOWL TOXICITY: None expected.

BIOCHEMICAL OXYGEN DEMAND: None.

FOOD CHAIN CONCENTRATION POTENTIAL: None expected.

13. DISPOSAL CONSIDERATION

WASTE DISPOSAL METHOD: Discard any product (including any retained materials of use), disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and local regulations.
RCRA Hazardous Waste No.: Not Federally regulated.

14. TRANSPORT INFORMATION

D.O.T.: Hazard Class — Not a corrosive, flammable, irritant, or explosive material. Not a Class B poison by skin contact or acute inhalation.

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

Under the TSCA rules for mixtures and naturally occurring substances the EPA considers this product to be a statutory mix, therefore, only its component oxides or metals shown in Section 2 of this MSDS are in the inventory. The human and the environmental hazards are, however, not the summation of the hazards of the components because the components do not separate from the product (see Section 10 of this MSDS). The hazards discussed in this MSDS are based on the product as a whole.

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQ's) and release reporting based on Reportable Quantities (RQ's) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are: ****NONE****

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are: ****NONE****

INTERNATIONAL REGULATIONS:

CANADA: This product is not classified as a controlled product under regulations pursuant to the federal Hazardous Product Act (e.g. WHMIS).

EEC: The components of this product (see first paragraph under U.S. FEDERAL REGULATIONS above) are listed in the European Inventory of Existing Commercial Chemical Substances (EINECS).

Zeolites are also listed under EINECS No. 2152838.

No component of this product is listed as a Dangerous Substance under a directive, or pursuant to another measure, of the European Community.

STATE REGULATIONS:

PROPOSITION 65: This product contains no levels of listed substances, which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute.

16. OTHER INFORMATION

REASON FOR MSDS REVISION: Change in format. Addition of toxicological and ecological information.

UOP

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A PRODUCT OF UOP

Lithographed in U.S.A.