

MONSANTO PRODUCT NAME  
**SULFURIC ACID CATALYST**  
 TYPE 516, TYPE 210, TYPE 11  
TYPE LP-120, TYPE LP-110

MONSANTO COMPANY  
 800 N. LINDBERGH BLVD.  
 ST. LOUIS, MO 63167  
 Emergency Phone No.  
 (Call Collect)  
 314-694-1000

**PRODUCT IDENTIFICATION**

**Chemical Name:** Mixture of inorganic potassium and vanadium salts on crystalline silica support

**DOT Proper Shipping Name:** Not Applicable

**DOT Hazard Class/I.D. No.:** Not Applicable

**DOT Label:** Not Applicable

**U.S. Surface Freight Classification:** Chemicals, N.O.I.B.N.

**Reportable Quantity (RQ) Under DOT (49 CFR) And CERCLA Regulations:** Not Applicable

**Hazard Categories under criteria of SARA Title III rules (40 CFR Part 370):**

	X	X			
	Acute Health	Chronic Health	Fire Hazard	Release of Pressure	Reactive Hazard

This product contains, as components, the substances listed below which are identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200):

- Crystalline silica, CAS No. 14464-46-1, an International Agency for Research on Cancer (IARC) listed carcinogen
- Amorphous silica, CAS No. 68855-54-9
- Vanadium salts

**WARNING STATEMENTS**

**WARNING!**  
 CAUSES IRRITATION TO THE EYES, SKIN AND RESPIRATORY TRACT

**PRECAUTIONARY MEASURES**

- Avoid contact with eyes, skin and clothing.
- Avoid breathing dust.
- Keep container closed.
- Use with adequate ventilation.
- Wash thoroughly after handling.

SAL 000009841

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

MATERIAL SAFETY DATA  
 Type 516, Type 210, Type 11, Type LP-120, Type LP-110  
 Sulfuric Acid Catalyst

## OCCUPATIONAL CONTROL PROCEDURES (Continued)

### Airborne

#### Exposure Limits: (Continued)

Component: Vanadium salts

Although OSHA and ACGIH have not established specific exposure limits for this material, they have established the following limits for nuisance dusts:

OSHA PEL/8-hour Time-weighted average: Total 15 mg/m<sup>3</sup>; Respirable 5 mg/m<sup>3</sup>  
ACGIH TLV/8-hour Time-weighted average: Total 10 mg/m<sup>3</sup>; Respirable 5 mg/m<sup>3</sup>

These limits are stated only to indicate the least stringent airborne dust exposure levels applicable to nuisance dusts. Because vanadium compounds cause respiratory tract irritation, bronchitis, influenza-like symptoms and possibly pneumonia, use engineering controls, administrative controls, and good work practices to control airborne dust as low as reasonable.

## FIRE PROTECTION INFORMATION

Noncombustible solid.

**Extinguishing Media:** If exposed to a fire from another source, use extinguishing agent suitable for that material.

#### Special Firefighting Procedures:

Fire fighters and others who may be exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

#### Unusual Fire and

#### Explosion Hazards:

Product may evolve small volumes of sulfur trioxide gas if heated above 805°F.

## REACTIVITY DATA

Stable material. Must keep catalyst dry to avoid degradation of product.

## HEALTH EFFECTS SUMMARY

The following information presents both human experience and the results of scientific experiments used by qualified experts to assess the effects of Sulfuric Acid Catalyst on the health of exposed individuals and to support the Precautionary Measures and Occupational Control Procedures recommended in this document. Proper evaluation of these health-related data may require the assistance of individuals trained in interpretation of this type of information.

### Effects of Exposure

Inhalation and dermal contact are expected to be the primary routes of occupational exposure to Sulfuric Acid Catalyst. Sulfuric Acid Catalyst is a complex mixture of salts of potassium, sodium, vanadium, sulfur and other complex metal sulfates. Occupational exposure to these catalysts has been reported to cause severe eye, skin and upper respiratory tract irritation. Industrial experience indicates that excessive exposure to vanadium compounds such as vanadium oxides and vanadates may produce productive cough, wheezing, difficulty in breathing, chest pains, bronchitis, inflammation of the mucous membranes of the nose, influenza-like symptoms, and possible pneumonia.

### Toxicological Data

Data from Monsanto studies indicate the following:

Oral LD<sub>50</sub> (Rat): 1,460 mg/kg, Slightly Toxic

Dermal LD<sub>50</sub> (Rabbit): >5,010 mg/kg, Practically Nontoxic

Eye Irritation (Rabbit): (FHSA) 19.5 on a scale of 110.0, Slightly Irritating

Skin Irritation (Rabbit): (FHSA) 0.0 on a scale of 8.0, Nonirritating

Health Effects Summary Continued On Next Page)

SAL 00009842

MATERIAL SAFETY DATA Type 516, Type 210, Type 11, Type LP-120, Type LP-110  
Sulfuric Acid Catalyst

## SPILL, LEAK & DISPOSAL INFORMATION

**Waste Disposal:** Sulfuric Acid Catalyst is not a "hazardous waste" as that term is defined in 40 CFR 261, "Identification and Listing of Hazardous Waste". Waste product should be disposed of in an approved chemical landfill in accordance with all applicable local, state and federal laws and regulations. Consult your attorney or appropriate regulatory officials for information on such disposal.

**Spill or Leakage Procedures:** Shovel into containers and cover.

Metal reclaimers are available to recover  $V_2O_5$  from disposed material.

**DATE:** 6/88  
**MSDS NO.:** M00006512

**SUPERSEDES:** 3/87

### FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

Manager, Product Safety  
Monsanto Chemical Company  
A unit of Monsanto Company  
(314) 694-1000

SAL 00009843

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MATERIAL SAFETY DATA  
Type 516, Type 210, Type 11, Type LP-120, Type LP-110  
**Sulfuric Acid Catalyst**

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**PRECAUTIONARY MEASURES**

- Avoid contact with eyes, skin and clothing.
- Avoid breathing dust.
- Keep container closed.
- Use with adequate ventilation.
- Wash thoroughly after handling.

SAL 000009844

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

MATERIAL SAFETY DATA  
Type 516, Type 210, Type 11, Type LP-120, Type LP-110  
**Sulfuric Acid Catalyst**

**EMERGENCY AND FIRST AID PROCEDURES**

**FIRST AID: IF IN EYES**, immediately flush with plenty of water for at least 15 minutes. Get medical attention.

**IF ON SKIN**, immediately flush with plenty of water. Remove contaminated clothing. Wash clothing before reuse.

**IF INHALED**, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention. Remove material from eyes, skin and clothing.

**IN CASE OF:**

**SPILL or LEAK**, shovel into containers and cover (see "Spill, Leak & Disposal Information" section).

**OCCUPATIONAL CONTROL PROCEDURES**

**Eye Protection:** Where there is significant potential for eye contact, wear chemical goggles and have eye baths available.

**Skin Protection:** Wear appropriate chemical resistant gloves and clothing to protect potentially exposed skin. Consult glove manufacturer to determine appropriate type glove for given application. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling.

**Respiratory Protection:** Avoid breathing vapor or dust. Use NIOSH/MSHA approved equipment when airborne exposure is excessive. Consult respirator manufacturer to determine appropriate type equipment for given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. Respiratory protection programs must be in compliance with 29 CFR 1910.134.

**Ventilation:** Provide sufficient ventilation to minimize exposure. Use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

**Airborne Exposure Limits:**  
 Product: Sulfuric acid catalyst  
 OSHA PEL/8-hour Time-weighted average: None established  
 ACGIH TLV/8-hour Time-weighted average: None established  
 Component: Crystalline silica (cristobalite) (approximately 25-40% by wt. of product)

OSHA PEL†: Total (product) dust:  $\frac{15 \text{ mg/m}^3}{\% \text{ SiO}_2 + 2}$

ACGIH TLV: Respirable (product) dust: 0.05 mg/m<sup>3</sup>

Component: Amorphous silica (approximately 15-25% by wt. of product)  
 OSHA PEL†: Total (product) dust:  $\frac{80 \text{ mg/m}^3}{\% \text{ SiO}_2}$  or 20 mppcf\*

ACGIH TLV: Total dust: 10 mg/m<sup>3</sup> 8-hour time-weighted average

† Values derived by these formulae are 8-hour time-weighted averages. The percentage of crystalline silica in the formulae is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

\* Millions of particles per cubic foot of air, based on impinger samples counted by light-field technics.

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(Occupational Control Procedures Continued On Next Page)

Sulfuric Acid Catalyst  
 Type 516, Type 210, Type 11, Type LP-120, Type LP-110

MATERIAL SAFETY DATA

**OCCUPATIONAL CONTROL PROCEDURES (Continued)**

**Airborne**

**Exposure Limits:** Component: Vanadium salts

**(Continued)**

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**Unusual Fire and Explosion Hazards:** Product may evolve small volumes of sulfur trioxide gas if heated above 805°F.

**REACTIVITY DATA**

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**HEALTH EFFECTS SUMMARY**

The following information presents both human experience and the results of scientific experiments used by qualified experts to assess the effects of Sulfuric Acid Catalyst on the health of exposed individuals and to support the Precautionary Measures and Occupational Control Procedures recommended in this document. Proper evaluation of these health-related data may require the assistance of individuals trained in interpretation of this type of information.

**Effects of Exposure**

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**Toxicological Data**

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Health Effects Summary Continued On Next Page)

SAL 000009846

MATERIAL SAFETY DATA Type 516, Type 210, Type 11, Type LP-120, Type LP-110  
Sulfuric Acid Catalyst

**HEALTH EFFECTS SUMMARY (Continued)**

**Components**

Data from Monsanto studies and from the available scientific literature on the components of sulfuric acid catalyst which have been identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200) are discussed below:

**Crystalline Silica (cristobalite)**

Sulfuric Acid Catalyst may contain up to 40% crystalline silica (cristobalite). Chronic inhalation of crystalline silica may cause a progressive pneumoconiosis (commonly known as silicosis), a form of disabling pulmonary fibrosis. Clinical signs and symptoms of silicosis include cough, dyspnea, wheezing and impairment of pulmonary function.

Crystalline silica is classified as "probably carcinogenic to humans" by the International Agency for Research on Cancer (IARC Monographs, Vol. 42). The IARC listing is based on their determination that there is limited evidence for the carcinogenicity of crystalline forms of silica in humans and sufficient evidence for the carcinogenicity of crystalline forms of silica in experimental animals. Epidemiology studies cited by IARC give indications of increased risk for dying from lung cancer in a working environment contaminated with crystalline silica, particularly in combination with other exposures.

**Vanadium Salts**

Sulfuric Acid Catalyst contains a mixture of vanadium salts (equivalent to 5-8% V<sub>2</sub>O<sub>5</sub>). Industrial experience indicates that exposure to vanadium compounds such as vanadium oxides and vanadates may produce productive cough, wheezing, difficulty in breathing, chest pains, bronchitis, inflammation of mucous membranes of the nose, influenza-like symptoms, and possibly pneumonia. Signs and symptoms of exposure to vanadium compounds include green tongue, metallic taste and eye, skin and throat irritation.

**Additional Information**

Threshold Limit Values (TLVs) have been established by the American Conference of Governmental Industrial Hygienists (ACGIH) for amorphous silica and crystalline silica, which are components of Sulfuric Acid Catalyst. For further information on these materials, please refer to the current edition of the *Documentation of Threshold Limit Values and Biological Exposure Indices*.

**PHYSICAL DATA**

<b>Appearance:</b>	Yellow to light green pellets 7/32" or 5/16" in diameter by 3/8" average length (Type 516, Type 210, Type 11)  1/2" or 3/8" in diameter by 1/2" average length (Type LP-120, Type LP-110)	
<b>Solubility:</b>	65-75% SiO <sub>2</sub> - insoluble 25-35% inorganic salts - partially soluble in water	
<b>Specific Gravity bulk (H<sub>2</sub>O = 1):</b>	0.60-0.70 (Types 516, 210, 11) 0.50-0.55 (Types LP-120, LP-110)	SAL 000009847

**Note:** These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Sulfuric Acid Catalyst  
Type 516, Type 210, Type 11, Type LP-120, Type LP-110

MATERIAL SAFETY DATA

## SPILL, LEAK & DISPOSAL INFORMATION

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**DATE:** 6/88  
**MSDS NO.:** M00006512

**SUPERSEDES:** 3/87

### FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

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SAL 000009848

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MATERIAL SAFETY DATA  
Sulfuric Acid Catalyst  
Type 516, Type 210, Type 11, Type LP-120, Type LP-110

**Monsanto MATERIAL SAFETY DATA**

**CA 031**

**Sulfuric Acid Catalyst**  
*Type 516, Type 210, Type 11, Type LP-120, Type LP-110*

**MATERIAL SAFETY DATA**

SAL 000009849

MATERIAL SAFETY DATA

**Sulfuric Acid Catalyst**  
Type 816, Type 210, Type 11, Type LP-120, Type LP-110

SAL 00009850

# Monsanto MATERIAL SAFETY DATA

**Sulfuric Acid Catalyst**  
Type 516, Type 210, Type 11, Type LP-120, Type LP-110

MATERIAL SAFETY DATA

SAL 000009851