# MATERIAL SAFETY DATA SHEET

Complies with U.S. OSHA
E.C. Guideline 91/155/EEC:
Revision: 1
Last Revision: July 2004

**EMERGENCY TELEPHONE NUMBERS:**
NATIONAL RESPONSE CENTER: 1-800-424-8802
CHEMTREC U.S. and CANADA: 1-800-424-9300
CHEMTREC International: 1-202-483-7616 (Collect)

Users of this product are requested to study this data sheet to learn the product's characteristics so that the product can be used safely. If the material is resold, the purchaser should be furnished a copy of this data sheet and the information should be made available to all users.

## SECTION 1
## Chemical Product and Company Identification

**Product Trade Name** **Vanadyl Sulfate Solution**

**Company Identification**
Stratcor, Inc. Tel.: (501) 262-1270
4285 Malvern Road Fax: (501) 262-2793
Hot Springs, Arkansas 71901; U.S.A.

**Inquiry Department**
Stratcor, Inc.; Pittsburgh, Pennsylvania 15205; U.S.A.
Tel.: (412) 787-4500; www.stratcor.com

## SECTION 2
## Composition and Information on Ingredients

**Chemical Characterization:**

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|---|---|
| **Chemical Description** | **Aqueous solution of vanadyl sulfate and sulfuric acid.** |
| **UN Number** | **UN 2922** |
| **DOT Guide** | **154** |
| **CAS No.** | |
| **Vanadyl Sulfate** | **27774-13-6 (15-40%)** |
| **Sulfuric Acid** | **7664-93-9 (1-5%)** |
| **Water** | **7732-18-5 (Balance)** |
| **EINECS No.** | |
| **Vanadyl Sulfate** | **248-652-7** |
| **Sulfuric Acid** | **231-639-5** |

## SECTION 3
## Hazards Identification

**Potential Hazards for Humans and Animals:**

**Eye Contact** Redness, swelling, pain, and flood of tears. Possible chemical burns and corneal damage.

**Skin Contact** Irritation with burning, reddening, and itching. Dermatitis.

**Inhalation** Breathing difficulty, irritation of mucous membranes, coughing, acute reaction to vanadium salts and sulfuric-acid mists.

**Ingestion** Chemical and irritation of the intestinal tract. Abdominal discomfort, vomiting, diarrhea, and spasms.

## SECTION 4
## First-Aid Measures

**General Information:**

**Inhalation** Move Immediately to fresh air. Administer oxygen if breathing is difficult. Administer artificial respiration is breathing has stopped. Obtain medical attention im-mediately.

**Skin** Immediately flush skin with plenty of water, while removing contaminated clothing. Obtain medical attention. Launder clothing before re-use. Destroy contaminated shoes.

**Eyes** Immediately flush eyes with plenty of water for at least 20 minutes. Check the victim for contact lenses and remove if present. Obtain immediate medical attention.

**Ingestion** Do not induce vomiting. Have victim rinse mouth with water and then give 1 to 2 glasses water to drink. Obtain medical attention immediately. Never give anything by mouth to an unconscious or convulsing person.

## SECTION 5

## Fire-Fighting Measures

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| **Suitable Extinguishing Media** | Use media suitable to the surrounding fire, such as water fog, dry chemical, foam, and carbon dioxide. |
| **Extinguishing Media Not to Be Used** | None. |
| **Special Exposure Hazards** | This product may release flammable hydrogen gas on contact with many common metals, which may significantly contribute to the risk of fire and explosion. Fire may result in toxic and irritating fumes. |
| **Special Protective Equipment for Fire Fighters** | Wear proper chemically resistant protective equipment and self-contained breathing apparatus (SCBA) operated in positive-pressure mode. |
| **Special Fire-Fighting Procedures** | Move container from fire area if it can be done without risk. Use water spray to keep fire exposed containers cool. Keep run-off water out of sewers and water sources. |

## SECTION 6

## Accidental-Release Measures

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| **Personal Precautions** | Wear appropriate chemically-protective equipment, such as gloves, a faceshield, goggles, and suitable body protection (see Section 8). Level B gear recommended for large releases. |
| **Environmental Precautions** | Prevent spilled product from entering drains,sewers, waterways, and soil. |
| **Cleaning Methods** | Ventilate area of release. Stop leak if possible without risk. Do not touch spilled material. Dike far ahead of spill with inert diking materials. For small spills, neutralize with soda ash, absorb spill with inert, non-combustible material such as clay then place in suitable containers. For large spills, contain spill with inert, noncombustible absorbent material such as clay or earth. Remove spilled liquid with pumps into suitable containers, or absorb with dry clay and shovel into polyethylene or plastic containers. Steel or aluminum containers may react with the product and dissolve. Wash thoroughly after dealing with a spillage. |

## SECTION 7

## Handling and Storage

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| **Safe Handling** | Always wear chemically-protective equipment during handling. Use in a well-ventilated area. Do not inhale vapors or mists. Do not allow contact with eyes, skin and clothing. Process and handling equipment must be resistant to dilute acidic solutions. Keep away from metals, bases and other incompatible materials. Wash thoroughly after handling material. |
| **Storage** | Store in closed, suitable containers located in a cool, dry, well-ventilated area. Store away from incompatibles. |

## SECTION 8

## Exposure Controls and Personal Protection

(Continued on Page 3)

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| **Occupational Exposure Limit** | Not listed in OSHA 29 CFR 1910.1000, Table Z-1 (Air Contaminants):<br>No published data for exposure limits for vanadyl sulfate<br>0.05 mg vanadium/$m^3$ 15-minute ceiling for vanadium compounds (NIOSH).<br>0.05 mg/$m^3$ for $V_2O_5$ (NIOSH TLV TWA)<br>1 mg/$m^3$ for $H_2SO_4$ (OSHA PEL, NIOSH TWA)<br>15 mg/$m^3$ for ILDH $H_2SO_4$ (OSHA) |

## SECTION 8

# Exposure Controls and Personal Protection

(Continued)

**Personal Safety Equipment:**

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| **Respiratory Protection** | Use respirators approved by NIOSH/MSHA; use SAR for oxygen-deficient atmosphere. |
| **Hand Protection** | Use chemically-protective gloves. |
| **Eye Protection** | Use chemical-splash goggles and a full face shield or mask. |
| **Skin Protection** | Wear chemically-protective clothing. |
| **Personal Hygiene** | Do not inhale vapors or mists. Do not allow contact with eyes, skin and clothing. Do not eat, drink, smoke or use cosmetics while working with this product. Thoroughly wash at the end of each work shift. Immediately remove any clothing that becomes contaminated and launder before re-use. Contaminated shoes should be destroyed. |

## SECTION 9

# Physical and Chemical Properties

**This MSDS reflects available research data and is not a product- or quality-specification document.**

**Appearance:**

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| **Physical State** | Liquid mixture. |
| **Form** | Solution. |
| **Color** | Dark blue. |
| **Odor** | None. |

**Change in Physical State:**

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| **Melting Point** | Not applicable. |
| **Boiling Point** | 120°C. (248°F). |
| **Flash Point** | None. |
| **Flammability** | Not applicable. |
| **Ignition Temperature** | Not applicable. |
| **Auto Flammability** | Not applicable. |
| **Oxidizing Properties** | May act as a catalyst in certain chemical environments. |
| **Explosive Properties** | Not applicable. |
| **Solubility in Water (20°C)** | Miscible with water at all concentrations. |
| **pH Value** | Less than 2. |

## SECTION 10

# Stability and Reactivity

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| **Stability** | Stable under the recommended storage and handling conditions prescribed. This product may release flammable hydrogen gas on contact with many common metals. Hazardous polymerization will not occur. |
| **Conditions to Avoid** | Contact with metals. Extreme heat. |
| **Incompatible Materials** | Strong bases, metals, water reactive materials, oxidizing agents. |
| **Hazardous Decomposition** | If heated or involved in a fire, toxic and irritating fumes of sulfur oxides and vanadium oxides may be formed. |

## SECTION 11
## Toxicological Information

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| **Acute Toxicity** | Harmful or fatal if inhaled. Inhalation of vapors or mists may cause severe irritation to the nose, throat and upper respiratory tract. Symptoms may include burning pain, coughing, wheezing and shortness of breath. Could cause bronchitis, lung injury and pulmonary edema. Effects of pulmonary edema may be delayed. |
| **Irritation** | Eye and skin irritant. Hazardous and may cause severe burns. |
| **Chronic Toxicity** | Prolonged or repeated skin contact may cause dermatitis (drying and cracking) or allergy-like eczematous skin lesions. Chronic inhalation could cause symptoms similar to those listed for acute inhalation, including bronchitis and possible lung injury. These effects may be reversible. |
| **Carcinogen Status:** | No data that indicates carcinogenity. |
| **Mutagen Status** | No data available. |
| **Teratogen Status** | No data indicating any hazards. |

## SECTION 12
## Ecological Information

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|---|---|
| **Persistence and Degradability** | The components of this product will react with other substances or be degraded over time into other inorganic compounds. |
| **Bioaccumulation** | No data available. |
| **Aquatic Toxicity and Other Data Relating to Ecotoxicity** | Components of this product can be harmful or fatal to aquatic organisms. The ecotoxic effects of the product itself have not been fully investigated. This material will lower the pH of any environment. |

## SECTION 13
## Disposal Considerations

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| **Product Disposal** | This product must be disposed of as a hazardous waste based on its harmful and irritating properties. Disposal should be made in compliance with Federal, state, and local environmental regulations. |
| **Packaging Disposal** | Empty containers must be disposed of as a hazardous waste based on its harmful and irritating properties. Disposal should be made in compliance with Federal, state, and local regulations. |

## SECTION 14
## Transport Information

**U.N. packaging requirements shall be met for air and non-U.S. shipments.**

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| **Proper Shipping Description** | Corrosive Liquid, Toxic, n.o.s., 8, UN 2922, II. (Contains surfuric acid, vanadyl sulfate). |
| **Land Transport** | U.S. DOT or appropriate local guidelines. |
| **Inland-Waterway Transport** | U.S. DOT or appropriate local guidelines. |
| **Sea Transport** | IMO / IMDG Code. Requires an IMO Shipper's Declaration Form. Container shipments require a Container Packing Certificate or Vehicle Packing Declaration. |
| **Air Transport** | ICAO-IT and IATA-DGR (passenger 1L, and cargo 30L). Requires an ICAO or IATA Air Declaration Form. |

## SECTION 15
# Regulatory Information

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| **Classification According to U.N. Guidelines** | Not listed. |
| **E.C. Danger Symbol** | |
| **R-Phrases** | R20 / 22 (Harmful by inhalation and if swallowed.)<br>R36 / 37 / 38 (Irritating to eyes, respiratory system and skin.) |
| **S-Phrases** | S51 (Use only in a well-ventilated area.)<br>S36 / 37 / 39 (Wear suitable protective clothing, gloves and eye/face protection.)<br>S24 / 25 (Avoid contact with skin and eyes.)<br>S26 (In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.)<br>S46 (If swallowed, seek medical advice immediately and show this container or label.)<br>S35 (This material and its container must be disposed of in a safe way.) |
| **U.S. EPA TSCA Inventory** | Listed in EPA TSCA inventory. |
| **CERCLA RQ / EHS Components** | No RQ has been established. |
| **U.S. EPA SARA III, Section 302** | Sulfuric acid has a TPQ of 454 kg (1,000 lbs.). Vanadyl sulfate is not listed. |
| **U.S. EPA SARA III, Section 304** | Sulfuric acid has a RQ of 454 kg (1,000 lbs.) or about 1,700 gallons of solution. Vanadyl sulfate has a RQ of 454 kg (1,000 lbs.) or about 200 gallons of solution. |
| **U.S. EPA SARA, Sections 311 and 312** | To be determined. |
| **U.S. EPA SARA III, Section 313** | Reporting required for aerosol forms of sulfuric acid. Vanadyl sulfate reporting not required. |
| **U.S. EPA CAA 112(r)** | Sulfuric acid: Not listed. Vanadyl sulfate: Not listed. |
| **Non-U.S. Requirements** | Refer to specific national guidelines. |

## SECTION 16
# Other Information

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*The material difference is value.*