Material Safety Data Sheet

Material Name: SCR Systems NOx Catalyst (Coal and HT) **ID: C-497**

* * * Section 1 - Chemical Product and Company Identification * * *

Product Use: Selective Catalytic Reduction Catalyst

Manufacturer Information

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Fax: USA email : sales@cormetech.com
Emergency # 24 Hr CHEMTREC U.S. (800) 424-9300
24 Hr CHEMTREC International (703) 527-3887

General Comments

NOTE: CHEMTREC telephone number is to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals.

* * * Section 2 - Hazards Identification * * *

Emergency Overview

This is a non-combustible, non-reactive solid material. It is supplied in the form of a yellowish-green to beige/grey solid. This product may be irritating to the eyes, respiratory system and skin. At very high exposure levels the dusts from this product may cause damage to the lungs. Components may cause allergic skin sensitization reaction.

Potential Health Effects: Eyes

Dust or powder may irritate eye tissue. Rubbing may cause abrasion of cornea.

Potential Health Effects: Skin

Dust or powder may irritate the skin. Mechanical rubbing may increase skin irritation. A component in this product may cause allergic skin reactions.

Potential Health Effects: Ingestion

May cause temporary irritation of the throat, stomach, and gastrointestinal tract. Acute ingestion may be harmful.

Potential Health Effects: Inhalation

Dusts from this product may cause irritation of the nose, throat, and respiratory tract. When inhaled in very large amounts, damage to the lung can occur.

Potential Environmental Effects

Not expected to be dangerous to the environment.

HMIS Ratings: Health: 1* **Fire:** 1 **Physical Hazard:** 0 **Pers. Prot.:** Safety glasses, gloves

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
66402-68-4	Ceramic materials and wares, chemicals	100
1314-35-8	Tungsten oxide (**See NOTE Below)	<24
1314-62-1	Vanadium Pentoxide (**See NOTE Below)	<5

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Nuisance particulates, Tungsten, insoluble compounds.

Component Information/Information on Non-Hazardous Components

Processing of this article may produce dusts or fumes which are considered hazardous under U.S. 29 CFR 1910.1200 (Hazard Communication) and the Canadian Controlled Product Regulations.

This product is a ceramic solid material created by combining various raw materials (e.g. oxides, etc.), heating these components together and cooling to a solid having its own unique properties.

**NOTE: These oxides are listed to provide the best available health information about the product. They are not separate components but are included in the Ceramic Materials and Wares component. This product was tested for orthorhombic vanadium pentoxide and none was detected. The detection limit of the test was 0.42%.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact, immediately flush eyes with large amounts of water, continuing to flush for 15 minutes. Get medical attention if irritation persists.

First Aid: Skin

Immediately flush exposed area with large amounts of water while removing contaminated clothing. Get medical attention if irritation persists. Launder contaminated clothing before reuse.

First Aid: Ingestion

Do not induce vomiting. Seek medical attention if material is ingested.

First Aid: Inhalation

If inhaled, remove person to fresh air. If symptoms develop or persist, get medical attention.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Material is not a fire hazard. Material may give off metallic oxides if exposed to high temperatures.

Hazardous Combustion Products

Metallic oxides may be given off at high temperatures.

Extinguishing Media

Use methods for the surrounding fire.

Fire Fighting Equipment/Instructions

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Fire fighters should avoid inhaling any combustion products.

NFPA Ratings: Health: 1 **Fire:** 1 **Reactivity:** 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Avoid creating dusts. Eliminate sources of ignition.

Clean-Up Procedures

Wear appropriate protective equipment and clothing during clean-up. Collect spill using a vacuum cleaner with a HEPA filter. Place in a closed container.

Evacuation Procedures

None necessary.

Special Procedures

Clean up and dispose of waste in accordance with all Federal, State and local regulations.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Avoid generation of airborne dusts. Do not inhale dusts. Do not allow material to come into contact with eyes or skin.

Storage Procedures

Store in a cool, dry area.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines

A: General Product Information

The OSHA (Vacated) air contaminants exposure limits (PELs) are those provided in the 1989 update to 29 CFR 1910.1000. These limits were vacated by OSHA and may not be enforceable.

B: Component Exposure Limits

Ceramic materials and wares, chemicals (66402-68-4)

ACGIH:	10 mg/m3 TWA (inhalable particles, recommended); 3 mg/m3 TWA (respirable particles, recommended) (related to Nuisance particulates)
OSHA (Final):	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction) (related to Nuisance particulates)
OSHA (Vacated):	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction) (related to Nuisance particulates)
Alberta:	10 mg/m3 TWA (total particulate); 3 mg/m3 TWA (respirable particulate) (related to Nuisance particulates)
British Columbia:	10 mg/m3 TWA (total dust); 3 mg/m3 TWA (respirable fraction) (related to Nuisance particulates)
Manitoba:	10 mg/m3 TWA (recommended, inhalable particles); 3 mg/m3 TWA (recommended, respirable particles) (related to Nuisance particulates)
New Brunswick:	10 mg/m3 TWA (particulate matter containing no asbestos and < 1% crystalline silica, inhalable fraction); 3 mg/m3 TWA (particulate matter containing no asbestos and < 1% crystalline silica, respirable fraction) (related to Nuisance particulates)
NW Territories:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass) (related to Nuisance particulates)
Nova Scotia:	10 mg/m3 TWA (recommended, inhalable particles); 3 mg/m3 TWA (recommended, respirable particles) (related to Nuisance particulates)
Nunavut:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass) (related to Nuisance particulates)
Ontario:	10 mg/m3 TWAEV (inhalable particulate); 3 mg/m3 TWAEV (respirable particulate) (related to Nuisance particulates)
Quebec:	10 mg/m3 TWAEV (total dust, containing no asbestos and less than 1% crystalline silica) (related to Nuisance particulates)
Saskatchewan:	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction) (related to Nuisance particulates) 20 mg/m3 STEL (inhalable fraction); 6 mg/m3 STEL (respirable fraction) (related to Nuisance particulates)

Tungsten oxide (1314-35-8)

ACGIH:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
OSHA (Vacated):	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
NIOSH:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
Alberta:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
British Columbia:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
Manitoba:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
New Brunswick:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
NW Territories:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
Nova Scotia:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
Nunavut:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
Ontario:	5 mg/m3 TWAEV (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEV (W) (related to Tungsten, insoluble compounds)
Quebec:	5 mg/m3 TWAEV (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEV (W) (related to Tungsten, insoluble compounds)
Saskatchewan:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)
Yukon:	5 mg/m3 TWA (W) (related to Tungsten, insoluble compounds)
	10 mg/m3 STEL (W) (related to Tungsten, insoluble compounds)

Vanadium Pentoxide (1314-62-1)

ACGIH:	0.05 mg/m3 TWA (V, inhalable fraction)
NIOSH:	0.05 mg/m3 Ceiling (V, dust and fume, 15 min)
Alberta:	0.05 mg/m3 TWA (V2O5, respirable fume or particulate)
British Columbia:	0.05 mg/m3 TWA (V, inhalable)
	0.05 mg/m3 Ceiling (V2O5, respirable dust and fume)
Manitoba:	0.05 mg/m3 TWA (V, inhalable fraction)
New Brunswick:	0.05 mg/m3 TWA (V2O5, respirable dust or fume)
Nova Scotia:	0.05 mg/m3 TWA (V, inhalable fraction)
Ontario:	0.05 mg/m3 TWAEV (respirable dust and fume)
Quebec:	0.05 mg/m3 TWAEV (V2O5, fume and respirable dust)
Saskatchewan:	0.05 mg/m3 TWA (V2O5, dust and fume, respirable fraction)
	0.15 mg/m3 STEL (V2O5, dust and fume, respirable fraction)
Yukon:	0.5 mg/m3 TWA (V, dust)
	1.5 mg/m3 STEL (V, dust)
	0.05 mg/m3 Ceiling (V, fume)

Engineering Controls

If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields.

Personal Protective Equipment: Skin

Wear leather or other appropriate work gloves, if necessary for type of operation. The use of coveralls is recommended.

Personal Protective Equipment: Respiratory

If ventilation is not sufficient to effectively prevent buildup of vapor/mist/dust/fume, appropriate NIOSH respirator protection must be provided.

Personal Protective Equipment: General

Use good hygiene practices when handling this material including changing and laundering work clothing after use.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Yellowish green to beige/grey solid	**Odor:**	Odorless
Physical State:	Solid	**pH:**	Not applicable
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable
Boiling Point:	Not applicable	**Solubility (H2O):**	Slight
Freezing Point:	Not applicable	**Particle Size:**	Not applicable
Softening Point:	Not applicable	**Evaporation Rate:**	Not applicable
Viscosity:	Not applicable	**Bulk Density:**	Not determined
Percent Volatile:	Not applicable	**Molecular Weight:**	Not applicable
Density:	<0.65 gm/cm3	**Auto Ignition:**	Not applicable
Flash Point:	Not applicable	**Flash Point Method:**	Not applicable
Lower Flammability Limit (LFL):	Not applicable	**Upper Flammability Limit (UFL):**	Not applicable
OSHA Flammability Classification:	Not applicable		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Stable

Chemical Stability: Conditions to Avoid

Avoid generation of airborne dusts.

Incompatibility

Avoid contact with oxidizing agents.

Hazardous Decomposition

Metallic oxides.

Possibility of Hazardous Reactions

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute Dose Effects

A: General Product Information

Overexposure to dusts from this product may cause eye irritation including irritation, redness, scratching of the cornea, and tearing. Mechanical irritation from inhalation of product dust may cause coughing, soreness of throat and nose, and sneezing.

Vanadium pentoxide dusts may cause a sensation of burning and irritation of eyes and signs of conjuctivitis and may also produce an allergic skin reaction. Acute exposure to vanadium pentoxide may cause a green discoloration of the tongue.

B: Component Analysis - LD50/LC50

Tungsten oxide (1314-35-8)

Oral LD50 Rat 1059 mg/kg

Vanadium Pentoxide (1314-62-1)

Inhalation LC50 Rat 2.21 mg/L 4 h; Oral LD50 Rat 10 mg/kg; Dermal LD50 Rat >2500 mg/kg

Repeated Dose Effects

Exposure to vanadium pentoxide for only a few days may cause rhinitis, dryness of the throat, hoarseness, bronchitis with coughing and wheezing, dyspnea, and pneumonitis. Chronic effects include lung damage, damage to the blood forming elements, and central nervous system effects.

Carcinogenicity

A: General Product Information

No information available for product.

B: Component Carcinogenicity

Vanadium Pentoxide (1314-62-1)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

IARC: Monograph 86 [2006] (Group 2B (Possibly carcinogenic to humans))

Developmental Effects

This product contains a substance(s) that is a possible reproductive hazard. This information is based on high dose tests on laboratory animals.

Other Toxicological Information

Under normal conditions of use for ceramic products, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

No data is available.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Environmental Fate

No data for this product is available.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

You must test your waste using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

B: Component Waste Numbers

Vanadium Pentoxide (1314-62-1)

RCRA: waste number P120

Disposal Instructions

Waste must be handled in accordance with all federal, state, provincial, and local regulations.

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

* * * Section 14 - Transportation Information * * *

US DOT Information

Shipping Name: Not regulated as a hazardous material

TDG Information

Shipping Name: Not regulated as a dangerous good.

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Vanadium Pentoxide (1314-62-1)

SARA 302: 100 lb lower threshold TPQ; 10000 lb upper threshold TPQ

CERCLA: 1000 lb final RQ; 454 kg final RQ

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Ceramic materials and wares, chemicals (1related to Nuisance particulates)	66402-68-4	No	No	No	No	No	Yes 1
Vanadium Pentoxide	1314-62-1	Yes	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Canadian WHMIS Information

A: General Product Information

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all information required by CPR.

WHMIS Classification:

D2A- Cancer, Reproductive effects

D2B- Irritating to eyes and skin. Skin sensitizer.

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Vanadium Pentoxide	1314-62-1	0.1 %

Additional Regulatory Information

A: General Product Information

No additional information.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Ceramic materials and wares, chemicals	66402-68-4	Yes	Yes	Yes
Tungsten oxide	1314-35-8	Yes	Yes	Yes
Vanadium Pentoxide	1314-62-1	Yes	Yes	Yes

* * * Section 16 - Other Information * * *

Other Information

Reasonable care has been taken in the preparation of this information, but Cormetech makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. Cormetech makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

MSDS History

Revision 1.0001; 15-JAN-2010: Section 9 edit for density.

Revision 1.0000, 08-JAN-2010: New MSDS.

Questions regarding information found in this document should be directed to the address and phone number shown in Section 1. If additional information is needed contact:

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Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act. CFR = Code of Federal Regulations. DSL = Canadian Domestic Substance List. EINECS = European Inventory of New and Existing Chemical Substances. EPA = Environmental Protection Agency. HEPA = High Efficiency Particulate Air. HMIS = Hazardous Material Identification System. IARC = International Agency for Research on Cancer. NFPA = National Fire Protection Association. NIOSH = National Institute of Occupational Safety and Health. NJTSR = New Jersey Trade Secret Registry. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. NA = Not available or Not Applicable. SARA = Superfund Amendments and Reauthorization Act. TLV = Threshold Limit Value. TSCA = Toxic Substance Control Act. WHMIS = Workplace Hazardous Materials Information System.

End of Sheet C-497