

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier**RM Number:** 8505**RM Name:** Vanadium in Crude Oil**Other Means of Identification:** Not applicable.**Recommended Use of This Material and Restrictions of Use**

This Reference Material (RM) is intended for the use in the calibration of instruments and techniques used for the analysis of high vanadium crude oils. A unit of RM 8505 consists of 250 ml of crude oil in a glass bottle. *This crude oil is unrefined and has physical properties similar to residual fuel oil No. 6, with a high flash point 70 °C (158 °F), high viscosity, and pour temperature of 12 °C.* There is also a trace amount of water present which should be handled as described in the NIST Report of Investigation.

Company Information

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2. HAZARDS IDENTIFICATION

Classification**Physical Hazard:** Flammable liquid, Category 4**Health Hazard:** Not classified.**Label Elements****Symbol**

No symbol/No pictogram

Signal Word

WARNING

Hazard Statement(s)

H227 Combustible liquid.

Precautionary Statement(s)

P210 Keep away from flames and hot surfaces. – No Smoking.

P280 Wear protective gloves, protective clothing, and eye protection.

P403+P235 Store in a well-ventilated place. Keep cool.

P501 Dispose of content and container in accordance with local regulations.

Hazards Not Otherwise Classified: None.**Ingredients(s) with Unknown Acute Toxicity:** None.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Crude oil**Other Designations:** Petroleum; petroleum crude; coal oil; crude oil; rock oil.

Components are listed in compliance with OSHA's 29 CFR 1910.1200. Trace amounts of hydrogen sulfide may be generated due to the sulfur content in the crude oil. There is not a direct correlation between hydrogen sulfide generation and the total sulfur content in this material.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Crude oil	8002-05-9	232-298-5	100

4. FIRST AID MEASURES

Description of First Aid Measures

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eye Contact: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion: DO NOT induce vomiting. If vomiting occurs, keep head lower than hips to help prevent aspiration. Get medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Irritation, cough, difficulty breathing, dermatitis.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Moderate fire hazard. Vapor/air mixtures are explosive above the flash point. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media

Suitable: Regular dry chemical, carbon dioxide, water, or regular foam.

Unsuitable: Avoid using straight water streams in order to prevent frothing.

Specific Hazards Arising from the Chemical: Not applicable.

Special Protective Equipment and Precautions for Fire-Fighters: Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 2 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection". Keep out of waters supplies and sewers.

Methods and Materials for Containment and Clean up: Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk, with water spray to reduce vapors. Absorb spilled material with sand or non-combustible material and collect in appropriate container for disposal.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

Storage and Incompatible Materials: Store in a well-ventilated area. Keep separated from incompatible substances (oxidizing materials).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

NIOSH (REL): 350 mg/m³ (TWA)
1800 mg/m³ (Ceiling 15 min)
1100 ppm (IDLH, 10 % LEL)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection Measures: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye Protection: Splash resistant safety goggles and emergency eyewash are recommended.

Skin and Body Protection: Chemical resistant clothing and gloves are recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Properties

Molar Mass (g/mol)	not applicable
Molecular Formula	not applicable
Appearance (physical state, color, etc.)	yellow to black, liquid
Odor	varies
Odor threshold	not available
pH	not available
Evaporation rate	not available
Melting point/freezing point	-60 °C to -20 °C (-76 °F to -4 °F)
Density ^(a)	0.986 kg/dm ³ at 20 °C
Vapor Pressure	>0.36 kPa at 20 °C
Vapor Density (air = 1)	not available
Viscosity	not available
Kinematic Viscosity ^(a)	1915 cSt at 50 °C
Solubilities	water: insoluble
Partition coefficient (n-octanol/water)	not available

Thermal Stability Properties

Autoignition Temperature	>400 °C (>752 °F)
Thermal Decomposition	not available
Initial boiling point and boiling range	<38 °C (<100.4 °F)
Explosive Limits, LEL	≈0.6 %
Explosive Limits, UEL	≈15 %
Flash Point ^(a)	70 °C (158 °F)
Flammability (solid, gas)	not applicable

^(a) Physical property listed in the NIST Report of Investigation.

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable Unstable

Possible Hazardous Reactions: Not applicable.

Conditions to Avoid: Avoid heat, flames, sparks, and other ignition sources. Avoid contact with incompatible materials. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers. Dangerous gases may accumulate in confined spaces.

Incompatible Materials: Oxidizing materials.

Hazardous Decomposition: Oxides of carbon and sulfur.

Hazardous Polymerization: Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Irritation, cough, difficulty breathing, dermatitis.

Potential Health Effects (Acute, Chronic, and Delayed)

Inhalation: Irritation hazard is low unless heated or misted. Vapor or mist may cause irritation, headache, drowsiness, dizziness, loss of coordination. Prolonged contact may cause irritation.

Skin Contact: May cause skin disorders, dermatitis, and rash.

Eye Contact: Irritation, conjunctivitis.

Ingestion: May cause nausea vomiting, diarrhea, other gastrointestinal disturbances, aspiration to the lungs may cause pneumonitis.

Numerical Measures of Toxicity

Acute Toxicity: Inhalation, Category 2

Rat, Oral, LD50: 4300 mg/kg

Rabbit, Dermal, LD50: >2000 mg/kg

Skin Corrosion/Irritation: Not classified.

Human, open skin: 100 %; Rabbit, skin: 500 mg (24 h) moderate

Serious Eye Damage/Eye Irritation: Not classified.

Rabbit, eyes: 100 mg mild; Human, eyes: 0.000125 ppm (5 h)

Respiratory Sensitization: No data available.

Skin Sensitization: No data available.

Germ Cell Mutagenicity: No data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ **Yes** _____ **X** **No**

Crude oils are listed by IARC as a Group 3, *not classifiable as its carcinogenicity to humans*.

Reproductive Toxicity: Not classified.

Rat, skin, TDLo: 200 mg/kg (pregnant 1 d to 19 d), 10 g/kg (pregnant 0 to 19 d)

Specific Target Organ Toxicity, Single Exposure: No data available.

Specific Target Organ Toxicity, Repeated Exposure: No data available.

Aspiration Hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Invertebrate: Water flea (*Daphnia magna*), EC50: <0.26 mg/L, static (48 h).

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA based on the flash point of 70 °C, this material is not regulated by IATA or by DOT in non- bulk quantities 49 CFR 173.150(f)(2).

15. REGULATORY INFORMATION

U.S. Regulations

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE HEALTH: Yes
CHRONIC HEALTH: Yes
FIRE: No
REACTIVE: No
PRESSURE: No

State Regulations: Not listed.

U.S. TSCA Inventory: Crude oil is listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations: WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 14 May 2014

Sources: ChemADVISOR, Inc., MSDS *Petroleum-Crude Oil (Untreated and Mildly-Treated)*, 21 March 2014.

World Health Organization, International Agency for Research on Cancer, *Occupational Exposures in Petroleum Refining; Crude Oil and Major Petroleum Fuels*, Vol. 45, (1998) available at <http://monographs.iarc.fr/ENG/Monographs/vol45/volume45.pdf> (accessed May 2014).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The values for this material are given in the NIST Report of Investigation.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.