

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 1052b
MSDS Number: 1052b
SRM Name: Bis(1-phenyl-1,3-butanediono)
oxovanadium(IV)

Date of Issue: 28 March 2012

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Description: This Standard Reference Material (SRM) was prepared to ensure material that is essentially free from other metals and has suitable solubility, compatibility, and uniformity for use in the preparation of a standard of vanadium in lubricating oil. A unit of SRM 1052b consists of 5 g of bis(1-phenyl-1,3-butanediono)oxovanadium(IV) powder.

Substance: Bis(1-phenyl-1,3-butanediono)oxovanadium(IV)

Other Designations: Bis(benzoylacetato)oxovanadium; oxobis(1-phenylbutane-1,3-dionato-O,O')vanadium; Bis(1-phenyl-1,3-butanedione)oxovanadium(IV)

2. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4): Health = 1 Fire = 0 Reactivity = 0

Major Health Hazards: Irritation; may be harmful if swallowed or inhaled.

Physical Hazards: Dust/air mixtures may ignite or explode.

Potential Health Effects (Acute and Chronic)

Inhalation: Inhalation of dust or fumes containing vanadium may cause respiratory tract irritation, metallic taste, greenish black discoloration of the tongue, sore throat, and sore chest. Repeated or prolonged exposure to low levels of vanadium dust or fumes may result in chronic bronchitis with or without emphysema, and hypertension. There may also be blood changes, liver damage and kidney damage. Sensitization reactions may occur.

Skin Contact: Exposure may cause irritation, allergic reactions, sensitization, dermatitis, and skin disorders.

Eye Contact: Exposure may cause irritation, blurred vision, burning sensation, and conjunctivitis.

Ingestion: Exposure may cause abdominal pain, nausea, and vomiting.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u>X</u>
In the International Agency Report on Carcinogens (IARC) Monographs	_____	<u>X</u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u>X</u>

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Registry	EC Number (EINECS)	Nominal Mass Concentration (%)
Bis(1-phenyl-1,3-butanediono)oxovanadium(IV)	14767-37-4	238-832-3	100

EC Classification: Not classified.

EC Risk (R No) and EC Safety (S No): Not assigned.

4. FIRST AID MEASURES

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

Eye Contact: Flush eyes with copious amounts of water for at least 15 minutes. Get medical attention, if necessary.

Skin Contact: Wash affected area with soap and water for at least 15 minutes. Seek medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Ingestion: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Slight fire hazard. Dust/air mixtures may ignite or explode.

Extinguishing Media: Regular dry chemical, carbon dioxide, water, regular foam.

Fire Fighting: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point: Not applicable.

Autoignition Temp: Not applicable.

Flammability Limits in Air

UPPER (Volume %): Not applicable.

LOWER (Volume %): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Handling and Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

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

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits

NIOSH (Ceiling): 0.05 mg/m³ (As V, dust and fume, 15 min, related to Vanadium compounds)

OSHA (TWA): 15 mg/m³ (total dust for particulates not otherwise regulated)

OSHA (TWA): 5 mg/m³ (respirable dust for particulates not otherwise regulated)

Ventilation: Use local exhaust ventilation system. Ensure compliance with applicable exposure limits. Refer to the ACGIH document, *Industrial Ventilation, a Manual of Recommended Practices*.

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

Eye Protection: Wear chemical safety goggles. An eyewash station should be readily available near areas of use.

Personal Protection: Wear appropriate chemical resistant clothing and gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Fine powder; no odor available.

Molar Mass (g/mol): 391

Molecular Formula: C₂₀H₁₈O₅V

Density: Not available.

Melting Point: Not available.

10. STABILITY AND REACTIVITY

Stability: Stable Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid generating dust. Avoid heat, flames, sparks and other sources of ignition.

Incompatible Materials: Halogens, oxidizing materials, and metals.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Miscellaneous decomposition products and oxides of carbon.

Hazardous Polymerization: Will Occur Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: Inhalation Skin Ingestion

Toxicity Data: No data available.

Health Effects (Acute and Chronic): See Section 2, "Hazards Identification" for potential health effects.

Target Organs: No data available.

Mutagen/Teratogen: No endpoints are listed by Registry of Toxic Effects of Chemical Substances (RTECS) for mutagenic, tumorigenic, or reproductive effects.

Medical Conditions Aggravated by Exposure: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No ecotoxicity data available.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: This material is not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. REGULATIONS

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

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

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

SARA Title III Section 313 (40 CFR 372.65): 0.1 % de minimis concentration, (chemical category N770, related to vanadium compounds).

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

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

ACUTE:	Yes
CHRONIC:	No
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not listed.

CANADIAN REGULATIONS

WHMIS Classification: Not provided for this material.

EUROPEAN REGULATIONS

EC Classification: Not classified.

EC Risk and EC Safety Phrases: Not assigned.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed.

TSCA 12(b)

Export Notification: Not listed.

16. OTHER INFORMATION

Sources: ChemAdvisor, Inc., MSDS *Vanadyl Acetylacetonate*, 20 December 2011.

ChemIDplus Advanced, *Bis(benzoylacetonato)oxovanadium*, CAS No. 14767-37-4
<http://chem.sis.nlm.nih.gov> (accessed March 2012).

EPA, *The Emergency Planning and Community Right-to-Know Act, Section 313 Release and Other Waste Management Reporting Requirements*, available at
http://www.epa.gov/tri/guide_docs/pdf/2000/brochure2000.pdf (accessed March 2012).

CDC NIOSH, *Particulates not otherwise regulated*, available at
<http://www.cdc.gov/niosh/npg/npgd0480.html> (accessed March 2012).

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