U. S. Department of Commerce
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National Bureau of Standards
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National Bureau of Standards

Report of Investigation

Research Material 8505

Vanadium in Crude Oil

Vanadium Concentration . . . . . 390 ± 10 μg/g

Research Material 8505 was developed primarily to further scientific or technical research on analytical methods related to the accurate determination of vanadium in crude oils. RM 8505 is intended for use in the calibration of instruments and techniques used for the analysis of high vanadium crude oils.

This Research Material should prove useful in quality control procedures wherein the effects of vanadium in the refining process are of concern.

CAUTION: This Research Material is a typical crude oil and contains visible amounts of water. Care must be exercised during sampling to avoid including water in the sample (refer to Materials Use section).

It is important to note that this is not a Standard Reference Material and none of the data presented in this Report of Investigation are certified. However, the values supplied herein are based on proven NBS methods.

Analyses for this Report of Investigation were performed in the Inorganic Analytical Research Division by E.S. Beary, J.D. Fassett, and H.M. Kingston, and in the Inorganic Materials Division by S. Weeks.

The overall direction and coordination of the technical measurements leading to this report were performed in the Inorganic Analytical Research Division by E.L. Garner.

The technical and support aspects involved in the preparation, analysis, and issuance of this Research Material were coordinated through the Office of Standard Reference Materials by T.E. Gills.

Material Description

Research Material 8505 is a Venezuelan crude oil. This material contains water that can be centrifuged with ~99% separation. The separated water, when analyzed, contains less than 25 ng/g of vanadium. This amount of vanadium (25 ng/g) is negligible when compared to the concentration of the total vanadium in the oil. However, this water can cause sampling problems leading to erroneous results (Materials Use section).

(over)

Materials Use

When not in use, the material should be kept in a tightly sealed bottle and stored at room temperature (~24 °C). Long term stability (>1 year) has not been rigorously assessed but any substantive change in the analyzed or investigated parameters listed on the Report of Investigation will be reported to the purchaser. Before use, the material should be stirred for at least one minute at 70 to 75 percent of the sample depth at ~24 °C and allowed to stand for 10 minutes before sampling. The material can then be sampled. The sample should always be extracted from the upper half of the remaining material.

Research Material 8505 was also tested for the following physical properties shown below.

Physical Properties for RM 8505

Ash Content Wt. %	Kinematic Viscosity @50 °C (cSt)	Flash Point (°C)	Pour Point (°C)	Density @ 20 °C Kg-dm^{-3}
0.08	1915	70	12	0.986

Summary

The values presented in this report are based on measurements using a single method or technique and are reported as *recommended values only*. The estimated uncertainty listed for the recommended value of vanadium is based on judgement. No attempt was made to derive exact statistical measures of imprecision. As more information becomes available in the future, this report will be updated. Your help in reporting data will be appreciated.

The analysis of RM 8505 for vanadium was done using SRM 1634a "Trace Elements in Fuel Oil" as a control.