

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 1819

Sulfur in Lubricating Base Oil

This Standard Reference Material (SRM) is intended primarily for use as an analytical standard for the determination of total sulfur in lubricating base oils or in similar materials. SRM 1819 consists of a series of 5 different 20 g aliquots of virgin lubricating base oils selected for sulfur concentrations in the range from 300 to 10,000 $\mu\text{g/g}$ (ppm).

The certified values for the sulfur content are given in Table 1 and are based on the use of two independent methods of analysis-microcoulometry and x-ray fluorescence. Noncertified values, provided for information only, of selected physical properties for SRM 1819 are given in Table 2.

Table 1
Certified Sulfur Content

Oil	Sulfur ($\mu\text{g/g}$)	Uncertainty ^a
I	299	± 8
II	1070	± 40
III	2865	± 70
IV	6030	± 130
V	10550	± 260

^aThe uncertainty listed represents \pm two times the standard deviation of the certified values and includes allowances for the variabilities within and between measurement methods and among samples.

NOTE: The certified values for SRM 1819 are valid for three years from date of purchase under proper storage conditions. The sample should be stored in a dry, cool place avoiding moisture and sunlight.

Analyses for the certification and material characterization were performed by R. Lawson, H. Nottingham, and P. Pei of the NBS Inorganic Materials Division.

The statistical analysis of the data was performed by R.C. Paule of the NBS National Measurement Laboratory.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of S.M. Hsu, Chief, NBS Inorganic Materials Division.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by W.P. Reed and R.L. McKenzie.

Gaithersburg, MD 20899
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Stanley D. Rasberry, Chief
Office of Standard Reference Materials

(Over)

Table 2
Physical Properties of SRM 1819

<u>Oil</u>	<u>Flash^a Point (°C)</u>	<u>Kinematic^b Viscosity (cSt)</u>		<u>Pour Point^c (°C)</u>	<u>Density @ 20°C^d (g/cm³)</u>	<u>Refractive Index^e (n_D20)</u>
		<u>40 °C</u>	<u>100 °C</u>			
I	216	29.14	4.94	-14	0.876	1.4822
II	248	102.22	10.83	- 8	0.882	1.4860
III	204	19.24	3.88	-23	0.853	1.4713
IV	256	87.10	10.09	-17	0.884	1.4914
V	280	132.67	13.47	- 9	0.890	1.4884

Methods Used for Physical Tests

- a. ASTM D93-80 Flash Point by Pensky-Martens Closed Tester.
- b. ASTM D445-79 Kinematic Viscosity of Transparent and Opaque Liquids.
- c. ASTM D97-66 (1978) Pour Point of Petroleum Oils.
- d. ASTM D405-281 Density and Relative Density of Liquids by Digital Density Meter (modified).
- e. ASTM D1218-61 Test for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids.