

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 1818

Total Chlorine in Lubricating Base Oil

This Standard Reference Material (SRM) is intended for use as an analytical standard for the determination of total chlorine in lubricating base oils or materials of similar composition. SRM 1818 consists of 20 g aliquots of five different lubricating base oils that have a nominal range of chlorine concentration from 30 to 600 $\mu\text{g/g}$ (ppm).

Total chlorine is certified on the basis of two independent methods of analysis: Neutron Activation Analysis (NAA) and X-Ray Fluorescence (XRF). The certified values and associated uncertainties are presented in Table 1.

Table 1

Total Chlorine Concentration (ppm)

<u>Oil</u>	<u>Chlorine ($\mu\text{g/g}$)</u>	<u>Uncertainty^a</u>
I	29	± 5
II	63	± 4
III	78	± 4
IV	231	± 6
V	558	± 11

^aThe uncertainties associated with the certified values are at least two standard deviations and include contributions from the observed variability within and between measurement methods and from any observed material heterogeneity.

Chemical analyses for the certification were performed by P. Pei (XRF) of the Ceramics Division and R. Fleming (NAA) of the Inorganic Analytical Research Division.

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

The physical properties of the oils in SRM 1818 were determined and are listed in Table 2. These values are not certified and are provided for information only.

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

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

Table 2

Physical Properties of SRM 1818 Lubricating Base Oils

Oil	Flash ^a Point (°C)	Kinematic ^b Viscosity (cst)		Pour ^c Point (°C)	Density ^d at 20 °C (g/cm ³)	Refractive ^e Index (n _D ²⁰)
		40 °C	100 °C			
I	252	62.46	8.66	-15	0.8743	1.4838
II	199	28.64	4.98	-10	0.8724	1.4817
III	232	25.54	4.62	-13	0.8704	1.4805
IV	199	31.15	5.25	-11	0.8758	1.4841
V	210	30.04	5.11	-10	0.8746	1.4830

Methods Used for Physical Tests

^aASTM D93-80, Flash Point by Pensky - Martens Closed Tester.

^bASTM D445-79, Kinematic Viscosity of Transparent and Opaque Liquids.

^cASTM D97-66 (1978), Pour Point of Petroleum Oils.

^dASTM D4052-81, Density and Relative Density of Liquids by Digital Density Meter (modified).

^eASTM D1218-61, Test for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids.

The measurements for Table 2 were performed by H. Nottingham and S. Weeks, Ceramics Division, Institute for Materials Science and Engineering.

The coordinators of the technical measurements were P. Pei, Research Chemist; R.G. Munro, Group Leader, Tribology Group; and S.M. Hsu, Chief, Ceramics Division, Institute for Materials Science and Engineering.