

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 1816a

Reference Fuel Isooctane

(2,2,4-Trimethylpentane)

(In cooperation with the Service des Matériaux
de Référence of the Bureau National
de Métrologie in Paris France)

This Standard Reference Material (SRM) is intended for use as a primary standard in the octane rating of motor and aviation fuels as specified in ASTM test methods (see Volume 05.04, Annual Book of ASTM Standards) and in evaluating ASTM methods for chemical analysis of fuels by gas chromatography (D 2268). This SRM exceeds the ASTM specification for a reference fuel. The certified values are:

Isooctane, purity by difference	99.987%
<u>Impurities</u>	
Total organics (other than Isooctane)	$0.010 \pm 0.002\%$
n-Heptane	$0.002 \pm 0.001\%$
Water	$0.003 \pm 0.002\%$

The lead concentration in this SRM is certified to be less than $10 \mu\text{g/L}$.

The material for this SRM was obtained from the Phillips Chemical Co. through the efforts of Mr. J.A. Grant of Amoco Oil Co. and the American Society for Testing and Materials (ASTM). The fuel was ampouled under the direction of NBS, and analyzed by NBS, the Laboratoire National d'Essais (LNE), and the Institut Français du Pétrole (IFP).

The homogeneity of this SRM, as determined by measurements on 15 samples, was found to be satisfactory.

All three laboratories followed the gas chromatography technique specified in ASTM Method D 2268 to determine organic impurities. The water content was determined by LNE using the classical Karl Fischer method.

The results obtained by the three laboratories are given below:

	<u>NBS</u>	<u>LNE</u>	<u>IFP</u>
n-Heptane	$0.002 \pm 0.001\%$	$0.002 \pm 0.001\%$	N.D.
Total organics	$0.009 \pm 0.002\%$	$0.012 \pm 0.001\%$	$0.009 \pm 0.002\%$
Water	-----	$0.003 \pm 0.002\%$	-----
Lead	$<0.7 \mu\text{g/L}$	$5.8 \pm 0.5 \mu\text{g/L}$	$<5 \mu\text{g/L}$

The lead concentration was determined by NBS and LNE using various modifications of ASTM Method D 1368- while IFP used a variation of atomic absorption spectrometry (D 3237).