U. S. Department of Commerce
Frederick B. Dent
Secretary
National Bureau of Standards
Richard W. Roberts, Director

National Bureau of Standards Certificate of Analysis

Standard Reference Material 1631

Sulfur in Coal

Rolf A. Paulson

This Standard Reference Material is intended primarily for use as an analytical standard for the determination of sulfur in coal. It is also certified for ash content. This standard consists of three different low-volatile bituminus coals, ground to pass a 60-mesh sieve, packaged separately. Each coal is certified for its sulfur and ash contents on an as-received basis.

	Percent by Weight	
Coal	Sulfur	Ash
A	0.546 ± 0.003	5.00 ± 0.02
B	2.016 ± .014	14.59 ± .09
C	3.020 ± .008	6.17 ± .02

The certified values are the means of 20 determinations of sulfur and 10 determinations of ash on 10 samples selected randomly from the lot of 2500 samples. The uncertainty represents the half widths of the 95% confidence intervals of the certified values. There was no evidence of heterogeneity of composition within the uncertainty limits reported.

The coals have been analyzed by four cooperating laboratories with results consistent with the certified values. All of the analytical work is summarized under the supplementary information.

The overall coordination of the technical measurements leading to certification was under the chairmanship of J. K. Taylor.

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 C. L. Stanley.

Washington, D. C. 20234
August 15, 1973

J. Paul Cali, Chief
Office of Standard Reference Materials

(over)

Supplementary Information

Analysis of Material

The methods of analysis used for certifying this material were essentially those identified as ASTM method D271. The following laboratories cooperated with NBS in the analysis of these coals: Association Technique de l'Importation Charbonniere, Hampton Roads Laboratory, Newport News, Virginia; Combustion Engineering Inc., Windsor, Connecticut; Eastern Associated Coal Corporation, Pittsburgh, Pennsylvania; and U. S. Bureau of Mines, Coal Analysis Laboratory, Pittsburgh, Pennsylvania.

Summary of Supporting Analytical Values

Coal	Laboratory	Sulfur, %	Ash, %
A	1	0.540 ± 0.006	4.847 ± 0.044
	2	.579 ± .006	4.792 ± .074
	3	.551 ± .016	5.134 ± .085
	4	.569 ± .017	4.865 ± .051
B	1	1.972 ± .016	14.50 ± .16
	2	2.019 ± .014	14.58 ± .06
	3	1.969 ± .031	14.61 ± .19
	4	1.988 ± .028	14.58 ± .16
C	1	3.018 ± .018	6.126 ± .031
	2	3.035 ± .031	6.013 ± .092
	3	2.915 ± .017	6.092 ± .056
	4	2.998 ± .020	6.045 ± .072

For the work performed in the cooperating laboratories the values for sulfur are the averages of twelve determinations. The values for ash are the averages of twelve determinations except laboratory No. 1, whose values are based upon 18 determinations for caols A and C and 17 determinations for coal B. The uncertainties are the 95 percent confidence limits.

Originally, the moisture content of these coals was to be certified; however, the lack of homogeneity in this respect prevented certification. Therefore, these values are reported for information only. The ranges of NBS values for moisture were: Coal A, 0.72 to 1.06 percent; Coal B, 0.48 to 1.00 percent; and Coal C, 0.15 to 0.70 percent.

Source of Material

Coal A - Keystone Mine No. 2, West Virginia
Coal B - Colver Mine, Pennsylvania
Coal C - Stigler Bed, Arkansas

These coals were procured and ground through the assistance and courtesy of David E. Wolfson and Forrest E. Walker, U. S. Bureau of Mines, Pittsburgh, Pennsylvania.

Use of Material

All analytical values are reported on an as-received basis so that no drying procedures should be used. The coals are packaged in hermetically sealed envelopes each containing approximately 3 g of the material. It is recommended that the envelopes be opened only at the time of analysis and that any unused contents be discarded.