



Designation: D 3172 – 89 (Reapproved 2002)

## Standard Practice for Proximate Analysis of Coal and Coke<sup>1</sup>

This standard is issued under the fixed designation D 3172; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last approval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This practice covers the determination of moisture, volatile matter, and ash and the calculation of fixed carbon on coals and cokes sampled and prepared by prescribed methods and analyzed according to ASTM established procedures.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 346 Practice for Collection and Preparation of Coke Samples for Laboratory Analysis<sup>2</sup>

D 388 Classification of Coals by Rank<sup>2</sup>

D 2013 Method of Preparing Coal Samples for Analysis<sup>2</sup>

D 2234 Test Methods for Collection of a Gross Sample of Coal<sup>2</sup>

D 3173 Test Method for Moisture in the Analysis Sample of Coal and Coke<sup>2</sup>

D 3174 Test Method for Ash in the Analysis Sample of Coal and Coke from Coal<sup>2</sup>

D 3175 Test Method for Volatile Matter in the Analysis Sample of Coal and Coke<sup>2</sup>

### 3. Terminology

#### 3.1 Definition:

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.21 on Methods of Analysis.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 05.05.

3.1.1 *proximate analysis of coal and coke*—an assay of the moisture, ash, volatile matter, and fixed carbon as determined by prescribed methods. Other constituents such as sulfur and phosphorus are not included.

### 4. Significance and Use

4.1 Test methods, as herein described, can be used to establish the rank of coals, show the ratio of combustible to incombustible constituents, provide the basis for buying and selling, and evaluate for beneficiation or for other purposes.

### 5. Sampling

5.1 Coal sample collection shall be in accordance with Sections 5 and 6 of Classification D 388, if the proximate analysis is to be used for classification of coal by rank. In all other cases, sample collection shall be in accordance with Test Methods D 2234. Preparation shall be in accordance with Method D 2013. Coke sampling shall be in accordance with Method D 346.

### 6. Test Methods

6.1 *Moisture*—Test Method D 3173.

6.2 *Ash*—Test Method D 3174.

6.3 *Volatile Matter*—Test Method D 3175. If the modified procedure is required, the report should show that the modified procedure was used.

6.4 *Fixed Carbon*—The fixed carbon is a calculated value. It is the resultant of the summation of percentage moisture, ash, and volatile matter subtracted from 100. All percentages shall be on the same moisture reference base.

$$\text{Fixed carbon, \%} = 100 - (\text{moisture, \%} + \text{ash, \%} + \text{volatile matter, \%}) \quad (1)$$