



Designation: D7582 – 24

Standard Test Methods for Proximate Analysis of Coal and Coke by Macro Thermogravimetric Analysis¹

This standard is issued under the fixed designation D7582; 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 reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These instrumental test methods cover the determination of moisture, volatile matter, and ash, and the calculation of fixed carbon in the analysis of coal and coke samples prepared in accordance with Practice D2013 and Practice D346.

1.2 These instrumental test methods are not applicable to thermogravimetric analyzers using microgram size samples.

1.3 Test Methods D3173, D3174, and D3175 shall be considered the referee test methods.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.5 *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.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D121 Terminology of Coal and Coke

D346 Practice for Collection and Preparation of Coke Samples for Laboratory Analysis

D2013 Practice for Preparing Coal Samples for Analysis

D3173 Test Method for Moisture in the Analysis Sample of Coal and Coke

D3174 Test Method for Ash in the Analysis Sample of Coal and Coke from Coal

D3175 Test Method for Volatile Matter in the Analysis Sample of Coal and Coke

D3176 Practice for Ultimate Analysis of Coal and Coke

D3180 Practice for Calculating Coal and Coke Analyses from As-Determined to Different Bases

D3302 Test Method for Total Moisture in Coal

D5016 Test Method for Total Sulfur in Coal and Coke Combustion Residues Using a High-Temperature Tube Furnace Combustion Method with Infrared Absorption

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology D121.

4. Summary of Test Method

4.1 In thermogravimetric analysis, the mass of a sample in a controlled atmosphere is recorded repeatedly as a function of temperature or time, or both. In *macro thermogravimetric* analysis, a sample size of approximately 1 g is used. All mass measurements are conducted by the system. In a typical analysis, the temperature is normally ramped from ambient to a specific temperature and held at that temperature for a prescribed length of time. The mass change is recorded repeatedly during the entire procedure. For the thermogravimetric analysis of coal and coke samples the moisture and ash analyses are complete when the sample reaches a constant mass as defined in the instrumental operating parameters. Alternatively, the measurement of moisture and ash can be considered complete after heating the sample for a fixed period of time. In the volatile matter analysis, the mass of the samples is determined after heating to 950 °C and held at this temperature for 7 min.

4.2 *Moisture* is determined by measuring the loss in mass of the analysis specimen of coal or coke when heated under specified conditions of temperature, time, atmosphere, specimen mass, and equipment specifications.

4.3 *Volatile matter* is determined by measuring the loss in mass of the analysis specimen of coal or coke when heated

¹ This test method 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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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.