



Designation: D 2361 – 95 (Reapproved 2001)

Standard Test Method for Chlorine in Coal¹

This standard is issued under the fixed designation D 2361; 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 This test method pertains to the determination of total chlorine content in a coal sample.

1.2 The values stated in SI units are regarded as the standard. The values shown in parentheses are for information only.

1.3 *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.* For specific hazard statements, see Note 2 and Section 8.

2. Referenced Documents

2.1 *ASTM Standards:*

D 121 Terminology of Coal and Coke²

D 1193 Specification for Reagent Water³

D 2013 Test Method of Preparing Coal Samples for Analysis²

E 144 Practice for Safe Use of Oxygen Combustion Bombs⁴

E 832 Specification for Laboratory Filter Paper⁴

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology D 121.

4. Summary of Test Method

4.1 The specimen is oxidized by combustion and the contained chlorine is absorbed in alkaline reagents using one of the following two procedures:

4.1.1 A weighed specimen is burned in a combustion bomb containing oxygen under pressure and a small amount of ammonium carbonate solution.

4.1.2 A weighed specimen is mixed with Eschka mixture and heated at a specified temperature in an oxidizing atmosphere.

4.2 The chlorides contained in the ammonium carbonate solution noted in 4.1.1 or extracted from the incinerated Eschka mixture noted in 4.1.2 are determined by potentiometric titration.

5. Significance and Use

5.1 The purpose of this test method is to measure the total chlorine content of coal. The chlorine content of coals may be useful in the evaluation of slagging problems, corrosion in engineering processes, and in the total analysis of coal and coke. When coal specimens are combusted in accordance with this test method, the chlorine is quantitatively retained and is representative of the total chlorine content of the whole coal.

6. Apparatus

6.1 *Balance*, analytical, with a sensitivity of 0.1 mg.

6.2 *Apparatus for Bomb Combustion of the Specimen:*

6.2.1 *Combustion Bomb*, constructed of materials that are not affected by the combustion process or products. The bomb shall be designed so that all liquid combustion products can be completely recovered by washing the inner surfaces. There shall be no gas leakage during a test. The bomb shall be capable of withstanding a hydrostatic pressure test of 20 MPa (300 psig) at room temperature without stressing any part beyond its elastic limit.

6.2.2 *Combustion Crucible*—An open crucible of platinum, quartz, or acceptable base-metal alloy. Base-metal alloy crucibles are acceptable, if after a few preliminary firings, the weight does not change significantly between tests.

NOTE 1—Stable crucible weight may be obtained by heat treating base-metal crucibles in a muffle furnace for 4 h at a temperature of 500°C.

6.2.3 *Ignition Wire*, nickel-chromium (Chromel C) alloy or iron, 100 mm length, 0.16-mm diameter (No. 34 B&S gage). Platinum or palladium wire, 0.10-mm diameter (No. 38 B&S gage), may be used.

6.2.4 *Ignition Circuit*, for ignition purposes, capable of providing 6 to 16-V ac or dc to the ignition wire. The ignition circuit shall be controlled with a momentary switch to avoid electrical shock to the operator. An ammeter or pilot light is required in the circuit to indicate when current is flowing. A step-down transformer, connected to an ac lighting circuit or batteries, may be used.

6.2.5 *Water Bath*—A container large enough to hold the combustion bomb with enough cooling water to cover the

¹ This test method is under the jurisdiction of ASTM Committee D05 on Coal Coke and is the direct responsibility of Subcommittee D05.21 on Methods of Analysis.

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² *Annual Book of ASTM Standards*, Vol 05.05.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.