Designation: D3997 – 97 (Reapproved 2004)

Standard Practice for Preparing Coke Samples for Microscopical Analysis by Reflected Light[1]

This standard is issued under the fixed designation D3997; 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 practice covers laboratory procedures for the preparation of granular samples of coke for examination with a reflected light microscope. The samples prepared are used for identifying and quantifying the textural components in coke. This practice does not apply to the preparation of oriented lump specimens of coke for structural analysis.

1.2 The values stated in SI units are to be regarded as the standard. The values given 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.*

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

D5061 Test Method for Microscopical Determination of the Textural Components of Metallurgical Coke

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Terminology

3.1 *Definitions*—For additional definitions of terms used in this practice, refer to Terminology D121.

3.1.1 *briquette*, *n*—a cylindrical block composed of granulated coal or coke particles compressed and embedded with an epoxy binder.

4. Summary of Practice

4.1 A representative sample is crushed to a specified particle size, oven-dried, mixed with a binder, and formed into a block specimen referred to as a briquette. The briquette is then polished to a flat, scratch-free surface for microscopical examination under reflected light.

5. Significance and Use

5.1 Briquettes of granular coke prepared in accordance with the laboratory procedures of this practice will have flat, scratch-free surfaces suitable for examination with a microscope using reflected light illumination. The polished surface of briquettes prepared using this practice will contain particles representative of the original gross sample.

5.2 Samples prepared by this practice are used for microscopical determination of the textural components in coke (see Test Method D5061).

6. Apparatus

6.1 *Grinder, Pulverizer, Mill, or Jaw Crusher*, or other suitable equipment for final crushing of the sample to pass a 2.36-mm (No. 8) sieve.

6.2 *Coarse Riffle Sampler*, with at least twelve divisions of not less than 12.7 mm (½ in.) and not greater than 19.1 mm (¾ in.).

6.3 *Medium Riffle Sampler*, with at least twelve divisions of not less than 6.4 mm (¼ in.) and not greater than 12.7 mm (½ in.).

6.4 *Sieves*—A 6.4-mm (¼-in.) and 2.36-mm (No. 8) U.S.A. Standard Sieve (see Specification E11).

6.5 *Molds*—Containers to hold the coke/binder mixture while the binder hardens. Generally, steel cylindrical molds are used (see Fig. 1). However, it is acceptable to use other mold materials that successfully yield the same type of briquette.

6.5.1 The mold shall be made of separable parts or some other design so that the briquette can be ejected after the briquette has hardened.

6.5.2 The mold shall be large enough to provide a plane area of 4 cm^2 or more on one side of the briquette. (Designs of suitable 25- and 32-mm (1- and 1¼-in.) inside-diameter molds are shown in Fig. 1).

[1] This practice is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.28 on Petrographic Analysis of Coal and Coke.

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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.