Designation: E 1568 – 93 (Reapproved 1998)

Standard Test Method for Determination of Gold in Activated Carbon by Fire Assay Gravimetry[1]

This standard is issued under the fixed designation E 1568; 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 covers the determination of gold in activated carbon by fire assay collection and gravimetric measurement. It covers the range of 15 to 5000 µg/g gold.

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 problems, 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 hazards statements, see Section 9 and Notes 2-4, Note 6, and Note 7.

2. Referenced Documents

2.1 *ASTM Standards:*

D 2862 Test Method for Particle Size Distribution of Granular Activated Carbon[2]

D 2866 Test Method for Total Ash Content of Activated Carbon[2]

D 2867 Test Method for Moisture in Activated Carbon[2]

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications[3]

E 50 Practices for Apparatus, Reagents, and Safety Precautions for Chemical Analysis of Metals[4]

E 173 Practice for Conducting Interlaboratory Studies of Methods for Chemical Analysis of Metals[4]

E 276 Test Method for Particle Size or Screen Analysis at No. 4 (4.75 mm) Sieve and Finer for Metal-Bearing Ores and Related Materials[4]

E 300 Practice for Sampling Industrial Chemicals[5]

E 882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory[6]

3. Terminology

3.1 *Definitions:*

3.1.1 *draft, n—in fire assay*, the control of air flow through a muffle furnace.

4. Summary of Test Method

4.1 The weighed test sample is ignited and fused with fire assay flux in a clay crucible. The lead metal from the fusion is separated and the precious metals concentrated by oxidation and adsorption of the lead on a cupel, the silver is parted with nitric acid, and the gold is annealed and weighed on a microbalance.

5. Significance and Use

5.1 In the primary metallurgical processes used by the mineral processing industry for gold bearing ores, gold is extracted with alkaline cyanide solutions and adsorbed onto activated carbon for recovery of the metal. Metallurgical accounting, process control, and ore evaluation procedures for this type of mineral processing plant depend on accurate, precise, and prompt measurements of gold concentrations in the activated carbon.

5.2 This test method for gold in activated carbon is intended primarily as a referee method to test such materials for metal content. It is assumed that those who use these procedures will be trained analysts capable of performing common laboratory procedures skillfully and safely. It is expected that work will be performed in a properly equipped laboratory and that proper waste disposal procedures will be followed. Appropriate quality control practices must be followed, such as those described in Guide E 882.

6. Interferences

6.1 Elements normally found in ore processing activated carbon do not interfere. When present, platinum group metals may be reported as gold in gravimetric fire assay determinations and must be less than 0.1 mg in the final gold bead.

7. Apparatus

7.1 *Analytical Balance*, capable of weighing to 0.1 g.

7.2 *Assay Mold*, 100-mL capacity.

7.3 *Cupel*, magnesite, 30-g lead capacity.

[1] This test method is under the jurisdiction of ASTM Committee E-1 on Analytical Chemistry for Metals, Ores, and Related Materials and is the direct responsibility of Subcommittee E01.02 on Ores, Concentrates, and Related Metallurgical Materials.

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[2] *Annual Book of ASTM Standards*, Vol 15.01.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] *Annual Book of ASTM Standards*, Vol 03.05.

[5] *Annual Book of ASTM Standards*, Vol 15.05.

[6] *Annual Book of ASTM Standards*, Vol 03.06.