



Standard Test Method for Volatile Matter in Green Petroleum Coke Quartz Crucible Procedure¹

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1. Scope

1.1 This test method covers the determination of the volatile matter produced by pyrolysis or evolved when petroleum coke is subjected to the specific conditions of the test method.

1.2 The interlaboratory study for precision covered materials with a volatile matter concentration ranging from about 8 to 16 %.

1.3 Samples having a thermal history above 600°C are excluded.

1.4 This test method is empirical and requires the entire test procedure to be closely followed to ensure that results from different laboratories will be comparable.

1.5 This test method is not satisfactory for determining dedusting material content.

1.6 The values stated in SI units are to be regarded as the standard.

1.7 *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 to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 11 Specification for Wire-Cloth Sieves for Testing Purposes²

E 220 Test Method for Calibration of Thermocouples by Comparison Techniques³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *analysis sample*—the reduced and divided representative portion of a bulk sample, prepared for use in the laboratory.

3.1.2 *analysis time*—period test samples are placed in the furnace, as determined in Section 9 (5 to 10 min).

3.1.3 *bulk sample*—the reduced and divided representative portion of a gross sample as prepared for shipment to and received by a laboratory, to be prepared for analysis.

3.1.4 *green petroleum coke*—same as raw petroleum coke

3.1.5 *gross sample*—the original, uncrushed, representative sample taken from a shipment or lot of coke.

3.1.6 *petroleum coke*—a solid, carbonaceous residue produced by thermal decomposition of heavy petroleum fractions or cracked stocks, or both.

3.1.7 *raw petroleum coke*—petroleum coke that has not been calcined.

3.1.8 *test sample*—the weighed portion of the analysis sample actually used in a test.

3.1.9 *volatile matter*—the mass loss on heating expressed as a percent of the moisture free sample used.

4. Summary of Test Method

4.1 Volatile matter of a moisture free petroleum coke is determined by measuring the mass loss of the coke when heated under the exact conditions of this test method.

5. Significance and Use

5.1 The volatile matter of petroleum coke affects the density of coke particles and can affect artifacts produced from further processing of the coke.

5.2 The volatile matter can be used in estimating the calorific value of coke.

6. Interferences

6.1 Moisture has a double effect. The mass loss is increased and the moisture free sample weight is decreased by the amount of moisture actually present in the test sample.

6.2 Particle Size Effect:

6.2.1 The particle size range of the analysis sample affects the volatile matter. The coarser the analysis sample, the lower the reported volatile matter will be. Crush analysis sample (see Annex A1) to pass a 0.250-mm opening (No. 60) sieve but do not overcrush. A 0.125-mm opening (No. 120) sieve should retain 40 to 55 % of the sample. Do not obtain the analysis sample by scalping and discarding a portion of the sample.

¹ This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.05 on Properties of Fuels, Petroleum Coke and Carbon Materials.

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² *Annual Book of ASTM Standards*, Vol 14.02.

³ *Annual Book of ASTM Standards*, Vol 14.03.