



Standard Test Method for Volatile Matter in Petroleum Coke¹

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1. Scope

1.1 This test method determines the volatile matter produced by pyrolysis or evolved when petroleum coke, or both, is subjected to the specific conditions of the test. Samples having a thermal history above 600°C are excluded.

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

1.3 This test method is not satisfactory for dedusting material content.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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.* Specific precautionary statements are given in Section 8.

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 Descriptions 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 *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.

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

3.1.4 *petroleum coke*—a solid, carbonaceous residue produced by thermal decomposition of heavy petroleum fractions and cracked stocks.

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

3.1.6 *volatile matter*—an empirical value equal to the mass loss on heating expressed as a percent of the moisture free sample used. It is determined only by this ASTM standard for petroleum coke.

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 procedure.

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 volatile matter will be. The analysis sample (see Annex A1) is crushed to pass a No. 60 sieve (0.250-mm opening) but is not overcrushed. A No. 120 sieve (0.125-mm opening) should retain 40 to 55 % of the sample. The analysis sample is not to be obtained by scalping and discarding a portion of the sample.

6.2.2 Any segregation of particle sizes within the analysis sample shall be corrected by reblending the sample just prior to weighing the test sample.

6.3 Downward drift of furnace temperature caused by an increase in the millivolts per degrees Celsius generated by an aging type K thermocouple produces a lower volatile matter value (Test Method E 220).

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 Oil Shale.

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² Annual Book of ASTM Standards, Vol 14.02.

³ Annual Book of ASTM Standards, Vol 14.03.