



Standard Test Method for Tar Acid Composition by Capillary Gas Chromatography¹

This standard is issued under the fixed designation D 5310; 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 quantitative determination of phenol and certain homologues of phenol in tar acid and cresylic acid mixtures using capillary gas chromatography. It is a normalization test method that determines homolog distribution but is not an absolute assay since it does not account for water or other compounds not detected by a flame ionization detector.

1.2 The following applies to all specified limits in this standard: for purposes of determining conformance with this standard, an observed value or a calculated value shall be rounded off “to the nearest unit” in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E 29.

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 Section 8.

2. Referenced Documents

2.1 ASTM Standards:

D 3852 Practice for Sampling and Handling Phenol and Cresylic Acid²

D 4790 Terminology of Aromatic Hydrocarbons and Related Chemicals²

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications³

2.2 Other Documents:

OSHA Regulations, 29 CFR, paragraphs 1910.1000, and 1910.1200⁴

3. Terminology

3.1 For definition of terms used in this test method see Terminology D 4790.

4. Summary of Test Method

4.1 The sample composition is determined by capillary gas chromatography. The weight percent composition is calculated from the ratio of the individual peak areas to the total area of all peaks using appropriate response factors determined for each component by means of a calibration sample.

5. Significance and Use

5.1 This test method is suitable for the general quantitative analysis of commercial tar acid mixtures. It may be used as a tool for quality control and specification purposes by producers and users.

6. Apparatus

6.1 *Chromatograph*—A gas chromatograph compatible with capillary columns, equipped with inlet splitter and high temperature flame ionization detector. Typical Operating Conditions are given in Table 1.

6.2 *Peak Integrator*—Electronic integration is recommended.

6.3 *Recorder*, with full scale response time of 1 s or less.

6.4 *Microsyringe*, capacity of 1 μ L.

6.5 *Capillary Column*—Any column capable of resolving all components of interest. Prepared columns are commercially available from chromatography supply houses. Chromatograms from three columns are presented in Fig. 1, Fig. 2, and Fig. 3. Peak identification is given in Table 2.

7. Reagents and Materials

7.1 *Calibration Standards*—Samples of known composition representative of samples to be analyzed.

8. Hazards

8.1 Consult current OSHA regulations and suppliers' material safety data sheets, and local regulations for all materials used in this test method.

9. Sampling

9.1 Sample the material in accordance with Practice D 3852.

10. Calibration

10.1 Prepare a sample of known composition to contain each component in the approximate concentration expected in

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² *Annual Book of ASTM Standards*, Vol 06.04.

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

⁴ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.