Designation: D7882 – 13

Standard Test Method for Determination of 4-Carboxybenzaldehyde and *p*-Toluic Acid in Purified Terephthalic Acid by Capillary Electrophoresis with Normal Voltage Mode[1]

This standard is issued under the fixed designation D7882; 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 4-carboxybenzaldehyde (4-CBA) and *p*-toluic acid (*p*-TOL) in purified terephthalic acid (PTA) by capillary electrophoresis (CE) with normal voltage mode and UV detection. It is applicable for 4-CBA from 5 to 400 mg/kg and for *p*-TOL from 10 to 400 mg/kg, respectively.

1.2 In determining the conformance of the test results using this method to applicable specifications, results shall be rounded off in accordance with the rounding-off method of Practice E29.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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]

D1193 Specification for Reagent Water

D4790 Terminology of Aromatic Hydrocarbons and Related Chemicals

D6809 Guide for Quality Control and Quality Assurance Procedures for Aromatic Hydrocarbons and Related Materials

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 *ISO Document:*[3]

EN ISO 8213 Chemical Products for Industrial Use—Sampling Techniques—Solid Chemical Products in the Form of Particles Varying from Powders to Coarse Lumps

2.3 *Other Document:*[4]

OSHA Regulations 29 CFR paragraphs 1910.1000 and 1910.1200

3. Terminology

3.1 *Definitions of Terms Specific to Normal Voltage Mode in this Standard:*

3.1.1 *capillary electrophoresis, n*—an electrophoretic technique in which a sample is introduced into a 50 to 100 µm i.d. fused-silica capillary filled with electrolyte solution and subjected to high voltage for separation.

3.1.1.1 *Discussion*—Normal voltage, with the anode on the injection side and the cathode on the detection side, is applied across the capillary causing electrolyte and analytes to migrate towards the cathode and through the capillary's UV detector window. Analytes are separated based on the differential rates of migration in the electric field. Analyte detection and quantitation are based on the principles of UV detection.

3.1.2 *electrolye, n*—a combination of a buffer reagent and an ion-pair reagent dissolved in an aqueous solution and placed inside the capillary, used as a carrier for the analytes.

3.1.3 *electroosmotic flow (EOF), n*—the directional velocity of electrolyte-solution flow within the capillary under an applied voltage; the velocity and direction of flow are determined by electrolyte chemistry, capillary-wall chemistry, and applied voltage (see Fig. 1).

[1] This test method is under the jurisdiction of ASTM Committee D16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.02 on Oxygenated Aromatics.

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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.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[4] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

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