



Designation: D5794 – 95 (Reapproved 2021)

Standard Guide for Determination of Anions in Cathodic Electrocoat Permeates by Ion Chromatography¹

This standard is issued under the fixed designation D5794; 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 guide is used for the determination of nitrate anion in electrocoat bath permeate by use of chemically suppressed and non-suppressed ion chromatography (IC).

1.2 Other anions, with the exception of phosphate, may be determined in electrocoat bath permeates by use of this guide.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D1193 Specification for Reagent Water

3. Significance and Use

3.1 It is important to monitor the anion concentrations and anion contaminants in electrocoat baths. Wet chemical methods are long, tedious, and of questionable accuracy in the ppm range. Ion chromatography offers a fast, convenient and accurate alternative. Since IC analysis of electrocoat bath samples is difficult, the permeates are often analyzed for

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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.

contaminants. This guide addresses some important considerations for such analyses.

4. Apparatus

4.1 A wide variety of ion chromatography columns, eluents, and operating parameters are available from commercial sources. The round robin studies conducted in conjunction with this guide's preparation utilized both suppressed and non-suppressed IC systems, acid and base eluents, strong and weak base eluents, and varying gradients and flow rates. All laboratories utilized a conductivity detector for their analysis.

4.2 Any properly maintained commercial IC system capable of separating, detecting, and quantifying anions by conductivity is deemed satisfactory.

5. Guidelines for Analysts

5.1 Utilize commercially available ANION standards or prepare anion standards from reagent grade chemicals and reagent water Type I (see Specification **D1193**).

5.2 Spurge all eluent solutions with helium for at least 15 min prior to performing an IC analysis.

5.3 When necessary, remove residual traces of organic compounds such as resin with properly pretreated precolumns.

5.4 Utilize at least three standards for calibration. Standards should be in the same approximate concentration ranges as the anion's concentration in the sample. Calibration standards should bracket the anion's concentration in the sample.


5.5 Calibrate instrument only after chromatogram's baseline is stable.

5.6 Use the peak area for the specific anion of interest as determined by an electronic integrator.

5.7 Use a sample of sufficient size to completely fill the ion chromatograph's injection loop.

6. Keywords

6.1 cathodic electrocoat; ion chromatography; nitrate; permeate

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