



Standard Practice for Testing Electrolytic Conductivity Detectors (ELCD) Used in Gas Chromatography¹

This standard is issued under the fixed designation E1698; 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 practice covers testing the performance of an electrolytic conductivity detector (ELCD) used as the detection component of a gas chromatographic system.

1.2 This practice is directly applicable to electrolytic conductivity detectors that perform a chemical reaction on a given sample over a nickel catalyst surface under oxidizing or reducing conditions and employ a scrubber, if needed, to remove interferences, deionized solvent to dissolve the reaction products, and a conductivity cell to measure the electrolytic conductivity of ionized reaction products.

1.3 This practice covers the performance of the detector itself, independently of the chromatographic column, in terms that the analyst can use to predict overall system performance when the detector is coupled to the column and other chromatographic system components.

1.4 For general gas chromatographic procedures, Practice E260 should be followed except where specific changes are recommended herein for the use of an electrolytic conductivity detector. For definitions of gas chromatography and its various terms see Practice E355.

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

1.6 *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.*

¹ This practice is under the jurisdiction of ASTM Committee E13 on Molecular Spectroscopy and Separation Science and is the direct responsibility of Subcommittee E13.19 on Separation Science.

Current edition approved Nov. 1, 2010. Published November 2010. Originally approved in 1995. Last previous edition approved in 2005 as E1698 – 95 (2005). DOI: 10.1520/E1698-95R10.

2. Referenced Documents

2.1 *ASTM Standards*:²

E260 Practice for Packed Column Gas Chromatography

E355 Practice for Gas Chromatography Terms and Relationships

3. Significance and Use

3.1 Although it is possible to observe and measure each of the several characteristics of the ELCD under different and unique conditions, in particular its different modes of selectivity, it is the intent of this practice that a complete set of detector specifications should be obtained at the same operating conditions, including geometry, gas and solvent flow rates, and temperatures. It should be noted that to specify a detector's capability completely, its performance should be measured at several sets of conditions within the useful range of the detector. The terms and tests described in this practice are sufficiently general so that they may be used at whatever conditions may be chosen for other reasons.

3.2 Linearity and speed of response of the recorder used should be such that it does not distort or otherwise interfere with the performance of the detector. Effective recorder response should be sufficiently fast so that it can be neglected in sensitivity of measurements. If additional amplifiers are used between the detector and the final readout device, their characteristics should also first be established.

4. Principles of Electrolytic Conductivity Detectors

4.1 The principle components of the ELCD are represented in Fig. 1 and include: a control module, a reactor assembly, and, a cell assembly.

4.1.1 The control module typically will house the detector electronics that monitor or control, or both, the solvent flow,

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.