



Standard Test Method for Carbon Tetrachloride and Chloroform in Liquid Chlorine by Direct Injection (Gas Chromatographic Procedure)¹

This standard is issued under the fixed designation E806; 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 is designed for the determination of carbon tetrachloride (CCl_4) and chloroform (CHCl_3) in liquid chlorine. The lower limit of detection is dependent on the sample size and the instrument used; five ppm (w/w) is achievable.

1.2 Review the current material safety data sheet (MSDS) for detailed information concerning toxicity, first aid procedures, and safety precautions.

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.* Specific hazards statements are given in Section 7 and in 9.2.3.

2. Referenced Documents

2.1 *ASTM Standards:*²

E180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

2.2 *Federal Standard:*⁴

49 CFR 173 Code of Federal Regulations Title 49 Transportation; Shippers' General Requirements for Shipments and Packagings, including Sections:

173.304 Charging of Cylinders with Liquefied Compressed Gas

173.314 Requirements for Compressed Gases in Tank Cars

173.315 Compressed Gases in Cargo Tanks and Portable Tank Containers

2.3 *Other Document:*

Chlorine Institute Pamphlet No. 77 Sampling Liquid Chlorine⁵

3. Summary of Test Method

3.1 A sample of liquid chlorine is injected into a gas chromatograph (GC), equipped with a column capable of separating CCl_4 and CHCl_3 from Cl_2 and other impurities, using a suitable syringe. The amounts of CCl_4 and CHCl_3 in the sample are determined by comparison of the areas of the peaks, obtained with the samples, to areas of peaks obtained with suitable calibration standards, under the same conditions.

4. Significance and Use

4.1 CCl_4 and CHCl_3 may be present in trace amounts in liquid chlorine. The use of chlorine to purify water would then transfer these compounds to the water. Therefore, when the concentrations of the CCl_4 and CHCl_3 in the liquid chlorine are known, the maximum amounts contributed to the water by the chlorine can be estimated.

5. Apparatus

5.1 *Gas Chromatograph*, equipped with:

5.1.1 *Injection Port*, must be lined with glass, Monel,⁶ or nickel; or column must be installed for on-column injection.

5.1.2 *Septa*, from Viton.⁷ Silicone septa may produce artifacts that may interfere with the analysis.

¹ This test method is under the jurisdiction of ASTM Committee E15 on Industrial and Specialty Chemicals and is the direct responsibility of Subcommittee E15.02 on Product Standards.

Current edition approved Dec. 15, 2008. Published January 2009. Originally approved in 1981. Last previous edition approved in 2003 as E806 – 99(2003). DOI: 10.1520/E0806-08.

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 The last approved version of this historical standard is referenced on www.astm.org.

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

⁵ Available from The Chlorine Institute Inc., 70 W. 40th St., New York, NY 10018.

⁶ Available from the International Nickel Company, Park 80 West, Plaza 2, Saddlebrook, NJ 07662.

⁷ Viton® septa can be prepared from Pierce No. 13235 Viton® hypo vial seals, available from the Pierce Chemical Co., Rockford, IL 61105. The septum is prepared by using a sharp blade to cut off the tip of the seal and then punching out a septum from the remaining flat disc. A cork borer or leather punch can be used to punch out the septum. Viton® septa are also available from Canton Bio-Medical Products, P.O. Box 2017, Boulder, CO 80302, Catalog No. V-101.

*A Summary of Changes section appears at the end of this standard