



Standard Methods for CONTINUOUS ANALYSIS AND AUTOMATIC RECORDING OF THE SULFUR DIOXIDE CONTENT OF THE ATMOSPHERE¹

This Standard is issued under the fixed designation D 1355; 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.

⁶ NOTE—9.1 was editorially revised in July 1972.

1. Scope

1.1 These methods cover the continuous analysis and automatic recording of the sulfur dioxide (SO₂) content of the atmosphere. Two methods are given, as follows:

	Sections
Method A—Conductivity Method	4 to 11
Method B—Electrolysis Method	12 to 22

2. Purity of Reagents

2.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.² Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

2.2 Unless otherwise indicated, references to water shall be understood to mean water conforming to ASTM Specification D 1193, Reagent Water.³

3. Sampling

3.1 For information on sampling, refer to ASTM Recommended Practice D 1357, Planning the Sampling of the Atmosphere⁴ and ASTM Recommended Practices D 1605, Sampling Atmospheres for Analysis of Gases and Vapors.⁴

METHOD A—CONDUCTIVITY METHOD

4. Scope and Application

4.1 This method is intended for the deter-

mination of low concentrations of SO₂ in the atmosphere. However, the method is not specific for SO₂, as other soluble electrolyte-forming gases such as halogen acids also affect the results.

NOTE 1—This method has been found suitable for use not only in locations where sulfur dioxide is practically the only atmospheric pollutant, but also in more complex urban locations. Simultaneous measurements in the Los Angeles area, made by this method and by use of an instrument (the Titrilog) that measures the amount of bromine required to oxidize the pollutants and that is sensitive to many possible constituents besides SO₂ to which this conductivity method is insensitive and *vice versa*, have indicated good agreement in general.

4.2 The lower limit of SO₂ concentration that can be satisfactorily measured by this test is about 0.01 ppm, while the upper limit can range from 3.0 to 10.0 ppm by simple modification of the liquid absorbent and gas volumes that are employed. Various other ranges, even up to 10 percent, can be obtained by using electrodes of suitable cell constant, and other gas and liquid volumes. Extension of the range below 0.01 ppm would require larger electrodes, temperature control, and attention to interference by aerosols, which are often present in this range. Filtration of the sample might be necessary.

¹ These methods are under the jurisdiction of ASTM Committee D-22 on Sampling and Analysis of Atmospheres.

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² "Reagent Chemicals, American Chemical Society Specifications," Am. Chemical Soc., Washington, D.C. For suggestions on the testing of reagents not listed by the American Chemical Society, see "Reagent Chemicals and Standards," by Joseph Rosin, D. Van Nostrand Co., Inc., New York, N.Y., and the "United States Pharmacopeia."

³ Annual Book of ASTM Standards, Part 31.

⁴ Annual Book of ASTM Standards, Part 26.