



Standard Test Method for Iron Content of Bisphenol A (4,4' - Isopropylidenediphenol)¹

This standard is issued under the fixed designation D 6143; 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 describes the procedure to determine the iron content of bisphenol A (4,4'-isopropylidenediphenol).

1.2 This test method has a lower detection limit of 0.1 mg/kg, and an upper limit of 20 mg/kg of iron in bisphenol A. If the iron content is higher, it will be necessary to dilute the sample.

1.3 The following applies to all specified limits in this test method: for purposes of determining conformance with this test method, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding off method of Practice E 29.

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 limits prior to use.* For a specific hazard statement, see Section 8.

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

D 4297 Practice for Sampling and Handling Bisphenol A (4,4' - Isopropylidenediphenol)³

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁴

E 691 Practice for Conducting an Interlaboratory Study to Determine Precision of a Test Method⁴

2.2 Other Documents:

OSHA Regulations 29CFR paragraphs 1910.1000 and 1910.1200.⁵

3. Summary of Test Method

3.1 Bisphenol A is dissolved in methanol, then acidified

with hydrochloric acid to convert any ferric iron present to ferrous iron. The ferrous iron is then complexed with FerroZine to form a red/pink chromophore that is quantified by visible spectrophotometry at 560 nm.

4. Significance and Use

4.1 Iron may increase the color of bisphenol A and affect other properties of end-use products.

4.2 High purity bisphenol A typically has less than 2 mg/kg of iron.

5. Interferences

5.1 Acetone and ethanol cause slow color development and should not be used as solvents for this test method.

6. Apparatus

6.1 Vis. Spectrophotometer.

6.2 Glass cell, 10 cm.

6.3 Volumetric Flasks, 100 mL and 1000 mL.

NOTE 1—All glassware used in this test method should be dedicated and thoroughly cleaned prior to use, by rinsing with concentrated hydrochloric acid solution followed by ferrozine solution, prepared as a blank in Section 7.

6.4 pH Meter.

7. Reagents and Materials

7.1 Hydrochloric Acid, concentrated, American Chemical Society (ACS) reagent grade.

7.2 Methanol, ACS reagent grade. Do not use methanol stored in steel containers.

7.3 Sodium Acetate, 2 M solution, ACS reagent grade.

7.3.1 This solution may be prepared by dissolving 272.0 g $\pm$ 0.1g of ACS reagent grade sodium acetate trihydrate or 164.0 $\pm$ 0.1g of ACS reagent grade sodium acetate in 1000 mL distilled water.

7.3.2 The sodium acetate trihydrate or sodium acetate may contain iron and should be purified as follows: To a separatory funnel, add 10 mL of bathophenanthroline solution (prepared by dissolving 0.25 g bathophenanthroline in 250 mL methanol), and 100 mL of 2 M solution of sodium acetate, and mix well. Add 15 mL of chloroform and shake the solution for 30 s. Allow the layers to separate. Draw off and discard the bottom red layer. Repeat the extraction with 15-mL portions of chloroform until the bottom layer is colorless.

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

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² Annual Book of ASTM Standards, Vol 11.01.

³ Annual Book of ASTM Standards, Vol 06.04

⁴ Annual Book of ASTM Standards, Vol 14.02.

⁵ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.