

Standard Test Method for Acetone in Methanol¹

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1. Scope

1.1 This test method covers a procedure for detecting the presence of acetone in methanol in amounts greater than 0.003 weight %.

1.2 *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.*

1.3 For hazard information and guidance, see the supplier's Material Safety Data Sheet.

2. Referenced Documents

2.1 *ASTM Standards:*

D 1193 Specification for Reagent Water²

3. Summary of Test Method

3.1 The specimen is reacted with Nessler's reagent and the turbidity that is produced is compared to a standard containing the equivalent of 0.003 weight % of acetone.

4. Significance and Use

4.1 This test method can be used to detect residual amounts of carbonyl compounds in synthetic and natural methanol. The carbonyl compounds are quantified by comparison to a known standard of acetone solution.

4.2 Carbonyl compounds may be present as a result of contamination during storage, distribution, or manufacture. This test method may be used in assessing compliance with a specification.

5. Apparatus

5.1 *Volumetric Pipets*, 1, 4, and 5-mL capacity.

5.2 *Test Tubes*, matched for color, 1.5 by 15 cm.

6. Reagents

6.1 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.³ 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.

6.2 Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Type IV of Specification D 1193. It is essential that the reagent water be free of ammonia.

6.3 *Acetone Standard*—Pipet 6.0 mL of acetone into a 1-L volumetric flask and dilute with water to the 1-L mark. Take 1.0 mL of the resulting solution and make up to 1 L with water in a volumetric flask. Five millilitres of this solution contain 0.024 mg of acetone. Under conditions outlined for this test method, the standard made up for comparison is equivalent to a methanol specimen containing 0.003 weight % of acetone.

6.4 *Nessler's Reagent:*

6.4.1 *Solution A*—Dissolve 270 g of sodium hydroxide (NaOH) pellets in water and dilute to 1 L.

6.4.2 *Solution B*—Dissolve 36 g of potassium iodide (KI) crystals and 13.6 g of mercuric chloride (HgCl₂) powder in water and dilute to 500 mL. To prepare the Nessler's reagent, mix three parts of Solution A with 5 parts of Solution B and allow to stand until clear before using.

7. Procedure

7.1 Carefully pipet 1 mL of the sample and 4 mL of water into one of the matched test tubes and mix thoroughly. Carefully pipet 5 mL of the acetone standard into a second matched test tube. Pipet 5 mL of the Nessler's reagent into each of the tubes containing the specimen and the acetone standard. Quickly mix the contents of each tube and allow both to stand for 5 min. At the end of the 5-min standing period, compare the turbidity of the specimen to the turbidity of the acetone standard.

8. Report

8.1 If the turbidity of the specimen is less than that of the acetone standard, report the acetone content is "less than 0.003

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² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopoeia and National Formulary*, U.S. Pharmacopoeial Convention, Inc. (USPC), Rockville, MD.

weight %.” If the turbidity of the specimen is greater than that of the acetone standard, report the acetone content as “greater than 0.003 weight %.”

9. Precision and Bias

9.1 *Precision*—Because of the “pass-fail” nature of this procedure, there is no precision statement.

9.2 *Bias*—Any material or contaminant that will react with Nessler’s reagent will affect the results.

9.2.1 The results are reported “less than” or “greater than” as acetone. Since various ketones or other carbonyl compounds may be present, the actual level of acetone may be different.

10. Keywords

10.1 methanol; methanol—acetone content; methyl alcohol; wood alcohol

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