



Designation: D7253 – 06

Standard Test Method for Polyurethane Raw Materials: Determination of Acidity as Acid Number for Polyether Polyols¹

This standard is issued under the fixed designation D7253; 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 measures the acidic constituents in polyether polyols and reports the results as acid number. The typical acid number range is 0-0.1 mg KOH/g sample. (See Note 1.)

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.*

NOTE 1—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*²

D883 Terminology Relating to Plastics

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

3. Terminology

3.1 *Definitions:* For definitions of terms used in this test method see Terminology D883.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *acid number*—the quantity of base, expressed in milligrams of potassium hydroxide, that is required to titrate acidic constituents in 1 g of sample.

4. Summary of Test Method

4.1 The sample is dissolved in 2-propanol. The resulting single-phase solution is titrated at room temperature with 0.02 N methanolic potassium hydroxide solution to an end point indicated by the color change (pink endpoint) of the added phenolphthalein.

NOTE 2—Phenolphthalein is the indicator of choice based on published

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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.

hydroxyl number methods that include an acid number correction. Other indicators can be chosen if specific acids are of interest. Bromothymol blue (green endpoint) can be used for stronger acids (pK_a 's $< \sim 4$) and thymolphthalein (blue endpoint) can be used for weak acids (pK_a 's $> \sim 7$).

5. Significance and Use

5.1 This test method is suitable for quality control, as a specification test, and for research. Acid numbers indicate the extent of any neutralization reaction of the polyol with acids. The results of this method measure batch-to-batch uniformity and are used as correction factors in calculating true hydroxyl numbers.

6. Interferences

6.1 Samples or constituents that are highly-colored will interfere with or prevent the use of this test method.

7. Apparatus

7.1 *Buret, 10 mL*, can be manual or automatic.

7.2 *Graduated cylinder, 10 mL, maximum.*

7.3 *Balance, analytical with sensitivity of at least ± 0.0001 g.*

7.4 *Erlenmeyer flask, at least 250 mL.*

7.5 *Stirring bars or stirring rods.*

8. Reagents and Materials

8.1 *Purity of Reagents*—Use reagent-grade chemicals in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society where such specifications are available.³ Other grades can 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.

8.2 *Phenolphthalein*, Indicator Grade.

8.3 *Phenolphthalein Indicator Solution*—Dissolve 1 g of phenolphthalein in 100 mL of methanol.

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 Pharmacopeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.