



Designation: D5629 – 11

# Standard Test Method for Polyurethane Raw Materials: Determination of Acidity in Low-Acidity Aromatic Isocyanates and Polyurethane Prepolymers<sup>1</sup>

This standard is issued under the fixed designation D5629; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope\*

1.1 This test method measures the acidity, expressed as ppm of hydrochloric acid (HCl), in aromatic isocyanate or polyurethane prepolymer samples of below 100 ppm acidity. The test method is applicable to products derived from toluene diisocyanate and methylene di(phenylisocyanate) (see [Note 1](#)). Refer to Test Method [D6099](#) for determination of acidity in moderate- to high-acidity aromatic isocyanates.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 *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—This standard is equivalent to ISO 14898, Method B.

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[D883 Terminology Relating to Plastics](#)

[D6099 Test Method for Polyurethane Raw Materials: Determination of Acidity in Moderate to High Acidity Aromatic Isocyanates](#)

[E180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals \(Withdrawn 2009\)](#)<sup>3</sup>

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee [D20](#) on Plastics and is the direct responsibility of Subcommittee [D20.22](#) on Cellular Materials - Plastics and Elastomers.

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<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

2.2 *ISO Standards:*<sup>4</sup>

[ISO 14898 Plastics—Aromatic Isocyanates for Use in the Production of Polyurethane—Determination of Acidity](#)

## 3. Terminology

3.1 *Definitions*—The terminology in this test method follows the standard terminology defined in Terminology [D883](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *acidity, n*—the acid strength of a sample expressed in ppm HCl.

## 4. Summary of Test Method

4.1 The isocyanate is mixed with an excess of n-propanol, a cosolvent and a known amount of HCl. Additional acid is released into the solvent system during urethane formation. The acid is then titrated potentiometrically with methanolic KOH. The same procedure is performed with a blank solution and the difference in titer is used to calculate the acidity present in the isocyanate sample.

## 5. Significance and Use

5.1 This test method can be used for research or for quality control to characterize aromatic isocyanates and low-acidity prepolymers. Acidity correlates with performance in some polyurethane systems.

## 6. Apparatus

6.1 *Disposable Beakers*, 250 mL.

6.2 *Repipet*, pipet or buret, 50 mL.

6.3 *Pipet*, 100 mL, class A volumetric; or a 100-mL buret with a dosing unit; or a 100-mL repipet, class A volumetric.

6.4 *Potentiometric Titrator:*

6.4.1 *Reference Electrode*—bridge-type electrolyte (double junction), sleeve-type diaphragm, having saturated LiCl/ethanol solution in both chambers, or equivalent.

6.4.2 *pH Glass Electrode* (see [Note 2](#)).

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

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