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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 12008.3-2026

**Plastics-Polyether polyols for use in the production of
polyurethane-Part 3:Determination of hydroxyl number**

塑料 聚氨酯生产用聚醚多元醇 第3部分：羟值的测定

(English Translation)

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Foreword

GB/T 12008 "Plastics - Polyether polyols" consists of 7 parts.

- Part 1: Designation system;
- Part 2: Specification;
- Part 3: Determination of hydroxyl number;
- Part 4: Determination of sodium and potassium;
- Part 5: Determination of acidity as acid number;
- Part 6: Determination of degree of unsaturation;
- Part 7: Determination of viscosity.

This Part is Part 3 of GB/T 12008. The degree of consistency with ISO 14900:2001 "Plastics - Polyols for use in the production of polyurethane - Determination of hydroxyl number" and ASTM D6342:2008 "Standard Practice for Polyurethane Raw Materials. Determining Hydroxyl Number of Polyols by Near Infrared (NIR) Spectroscopy" is non-equivalent.

This Part replaces GB/T 12008.3-1989 "Polyether polyols - Determination of hydroxyl number".

Compared with GB/T 12008.3-1989, the main changes in this Part are as follows.

- changed the standard name;
- added catalyst imidazole into phthalic anhydride acylation reagent (5.2 of Edition 1989, 4.3.3 of this Edition);
- reduced reflow time (8.2 of Edition 1989, 4.5.2 of this Edition);

- added Method B - Near infrared spectroscopy (Clause 5 of this Edition).

Annex A of this Part is informative.

This Part was proposed by China Petroleum and Chemical Industry Association.

This Part shall be under the jurisdiction of Subcommittee on General Methods and Products for Plastic Resins of National Technical Committee on Plastics of Standardization Administration of China (SAC/TC 15/SC 4).

Main drafting organizations of this Part. Jiangsu Chemical Research Institute Co., Ltd., Sinopec Group Asset Management Co., Ltd. Shanghai Gaoqiao Branch.

1 Scope

1.1

This Part of GB/T 12008 specifies two methods for the determination of the hydroxyl value of polyether polyols.

1.2 Method A is phthalic anhydride method. It is recommended for polyether

polyols, polymer polyols and polyols with ammonia as initiator. But for polyols with steric hindrance, the result shall be lower. If corrective measures can be taken, other polyols can also apply this method.

1.3 Method B specifies the determination of hydroxyl value in polyether polyols

by near infrared spectroscopy. It describes the steps of sample selection, data collection, establishment and verification of calibration models.

2 Normative references

The provisions in following documents become the provisions of this Part of GB/T 12008 through reference in this Part. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Part, however, parties who reach an agreement based on this Part are encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

GB/T 601-2002, Chemical Reagent - Preparations of Standard Volumetric Solutions GB/T 2035-2008, Terms and definitions for plastics (ISO 472:1999, IDT) GB/T 6682-2008, Water for analytical laboratory use - Specification and test methods (ISO 3696:1987, MOD) ASTM D7253:2006, Standard Test Method for Polyurethane Raw Materials - Determination of Acidity as Acid Number for Polyether Polyols

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 2035-2008 as well as the followings apply.

3.1 Polyurethane

a polymer made by reacting organic diisocyanates or polyisocyanates with compounds containing two or more hydroxyl groups

4.1 Principle

The hydroxyl groups in the sample are esterified by refluxing in the pyridine solution of phthalic anhydride.

4.2 Interference

4.2.1

Excessive water shall destroy the esterification reagent and interfere with the determination. If the moisture content of the sample is greater than 0.2%, use a reagent that shall not introduce acid or alkali into the sample to dry.

4.2.2 Primary, secondary amino and long-chain fatty acids react with reagents

to form stable compounds, which shall be included in the results.

4.3 Reagents

Unless otherwise stated, only use analytical reagents. The test water shall conform to grade three water specification in GB/T 6682-2008.

4.3.1

Imidazole.

4.4.1 Potentiometer or pH meter. the accuracy is not less than 0.1mV, equipped

with a pair of electrodes or glass-calomel composite electrodes, a burette with a capacity of 100mL or a burette that can be automatically backfilled.

4.4.2 Syringe. 2mL, 5mL and 10mL, with a hole suitable for processing viscous

polyols.

4.4.3 Magnetic stirrer

4.4.10 Erlenmeyer flask. 300mL, standard 24/40 ground mouth.

4.4.11 Air condenser. 400mm, standard 24/40 ground.

4.4.12 Oil bath. keep the temperature at $(115 \pm 2)^{\circ}\text{C}$.

4.5.2 Accurately pipette 25mL of phthalic anhydride acylation reagent (4.3.3)

into each test material and blank Erlenmeyer flask. Shake the flask until the test material dissolves. Each Erlenmeyer flask is connected to an air condenser (4.4.11). Put it in the $(115 \pm 2)^{\circ}\text{C}$ oil-bath (4.4.12) for 30min.

4.5.3 After heating, take the device out of the oil bath and cool to room

temperature. Use 30mL of pyridine (4.3.2) to rinse the condenser and remove the condenser tube. Quantitatively transfer the solution to a 250mL beaker (4.4.8). Use 20mL of pyridine to rinse the Erlenmeyer flask.

4.5.4 Titrate the solution in one of the following methods.

4.5.5 Measure the acid value C according to ASTM D7253:2006.If the solution

for determining the acid value is pink, follow the steps below to determine the base value L.

4.6 Result calculation and expression

4.6.1

Hydroxyl value OHV, in milligrams of potassium hydroxide consumed per gram of sample, is calculated according to formula (2).

4.7 Precision

See Annex A for precision data.

4.8 Test report

The test report shall contain the following.

5.1 Principle

Near-infrared spectroscopy is mainly generated when the molecular vibration transitions from the ground state to the higher energy level due to the non-resonance of the molecular vibration.