

ICS 83.080.10

CCS G 31



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

GB/T 46211-2025

**Plastics - Hardeners and accelerators for epoxide resins -
Determination of free acid in acid anhydride**

塑料 环氧树脂固化剂和促进剂 酸酐中游离酸的测定

(English Translation)

Issued on: August 29, 2025

Implemented on: March 1, 2026

Issued by: State Administration for Market Regulation

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is modified to adopt ISO 7327:1994 "Determination of free acid in anhydrides of epoxy resin curing agents and accelerators".

This document has undergone the following structural adjustments compared to ISO 7327:1994.

---A chapter on "Terms and Definitions" has been added;

---Chapter 4 corresponds to Chapters 3 through 7 of ISO 7327:1994, with section 4.1 corresponding to Chapter 3 of ISO 7327:1994;

4.2 corresponds to Chapter 4 of ISO 7327:1994; 4.3 corresponds to Chapter 5 of ISO 7327:1994; 4.4 corresponds to ISO 7327.

Chapter 6 of ISO.1994; 4.5 corresponds to Chapter 7 of ISO 7327:1994;

---Chapter 5 has been added;

---Chapter 6 corresponds to Chapter 8 in ISO 7327:1994.

The technical differences between this document and ISO 7327:1994, and the reasons therefor, are as follows.

---The normative reference document GB/T 601 (see 5.2.3) has been added to adapt to my country's technical conditions;

---ISO 760 (see 4.2.1, 4.2.2) has been replaced with the normatively referenced GB/T 6283

to adapt to my country's technical conditions and add [further details needed].

Operability;

---The normative reference GB/T 6682 (see 4.2) has been added to adapt to my country's technical conditions;

---The normative reference GB/T 12808-2015 (see 4.3.5) has been added to adapt to my country's technical conditions;

---Added laboratory water quality requirements (see 4.2) to adapt to my country's technical conditions and increase operability;

---Added accuracy class requirements for single-mark pipettes (see 4.3.5) to adapt to my country's technical conditions and increase operability;

---When plotting the standard curve, the volume of the free acid standard solution was increased from 4 points to 10 points (see 4.4.2) to suit my country's...

Technical conditions;

---Polypotential titration (see Chapter 5) has been added to adapt to my country's technical conditions and better meet users' requirements for product quality control;

---Added requirements to the test report for indicating the calculation basis and test date for potentiometric titration [see Chapter 6 d) and f)], adding...

The document is easy to use and convenient to apply.

The following editorial changes have been made to this document.

---Added a warning;

---The test method in ISO 7327:1994 is listed as Method A. Spectrophotometry (see Chapter 4);

---Added a formula number for calculating the free acid content in acid anhydrides, denoted by w (see 4.5).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Plastics Standardization (SAC/TC15).

1 Scope

This document describes two methods for determining the free acid content in epoxy resin anhydride curing agents and accelerators. spectrophotometry and potentiometric titration.

method.

The spectrophotometric methods described in this document are applicable to most acid anhydrides, except for polyesters and oligomeric anhydrides (also known as "oligomeric anhydrides"). Potentiometric titration is suitable for...

Used for all acid anhydrides.

Note: Spectrophotometric tests on polyesters and oligomeric anhydrides show significant dispersion.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 601 Preparation of Standard Titration Solutions for Chemical Reagents GB/T 6283 Determination of Moisture Content in Chemical Products - Karl Fischer Method (General Method) (GB/T 6283-2008) ISO 760:1978, NEQ GB/T 6682 Specifications and test methods for water used in analytical laboratories GB/T 12808-2015 Laboratory Glassware - Single-mark Pipettes

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4.1 Detection Principle

In anhydride-based curing agents and accelerators, a small amount of free acid reacts with Rhodamine 6G (Basic Red 1) to produce a pink color reaction. This is observed using spectrophotometry.

The absorbance at a wavelength of 510 nm was measured using a photometer, and the content of free acid was determined from the standard curve.

4.2 Reagents

During the analysis, unless otherwise specified, analytical grade reagents and laboratory grade III water or higher shall be used in accordance with GB/T 6682.

Water of high purity.

4.2.1 Anhydrous methyl ethyl ketone (butane-2-one or 2-butanone)

Place 100g of 4A molecular sieve into 1L of methyl ethyl ketone. After standing for 24 hours, pour off the supernatant, being careful not to include any 4A molecular sieve particles.