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**Plastics - Epoxy resins - Determination of electrical  
conductivity of aqueous resin extracts**

塑料 环氧树脂 水萃取液电导率的测定

(ISO 21318:2007, IDT)

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## Foreword

This document is drafted in accordance with GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document is identical to ISO 21318:2007 "Plastics - Epoxy resins - Determination of electrical conductivity of aqueous resin extracts".

This document adds two Clauses "Normative references" and "Terms and definitions".

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority of this document shall not be held responsible for identifying any or all such patent rights.

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

This document shall be under the jurisdiction of National Technical Committee 15 on Plastic of Standardization Administration of China (SAC/TC 15).

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# Plastics - Epoxy resins - Determination of electrical conductivity of aqueous resin extracts

**Warning: Personnel using this document should be familiar with normal laboratory operations. This document does not purport to address all safety issues during use. Users shall develop safety and health measures and ensure compliance with regulatory requirements.**

## 1 Scope

This document describes a method for determining the electrical conductivity of the aqueous extract obtained by extracting epoxy resins with water at 95 °C.

This document is only applicable to epoxy resins that are in a molten state at extraction temperature (95 °C).

This method is of great significance to epoxy resin used as insulating material for electronic equipment. The electrical conductivity of the extract is used to evaluate the concentration of ionic substances in the resin.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

There are no terms and definitions to be defined in this document.

## 4 Reagents

Water: Use distilled water and/or deionized water with an electrical conductivity lower than 2.0  $\mu\text{S}/\text{cm}$ .

## 5 Apparatus

**5.1** Electrical conductivity meter: Accurate to 0.1  $\mu\text{S}/\text{cm}$ . It can be immersed in the aqueous extract and has temperature compensation function.

**5.2** Glass measuring cylinder: 100 mL.

5.3 Analytical balance: Accurate to 0.01 g.

5.4 Electrothermal blowing drying oven: It is capable of maintaining a temperature of  $95\text{ }^{\circ}\text{C}\pm 3\text{ }^{\circ}\text{C}$ .

5.5 High-density polyethylene bottle: 100 mL (with a screw cap).

5.6 Polyethylene cup: 100 mL.

## 6 Test procedure

6.1 Weigh  $8.00\text{ g}\pm 0.05\text{ g}$  of test portion into a 100 mL high-density polyethylene bottle (5.5).

6.2 Add  $80\text{ mL}\pm 2\text{ mL}$  of water into the bottle and cover it.

6.3 Put the bottle into the electrothermal blowing drying oven (5.4) which has been stabilized at  $95\text{ }^{\circ}\text{C}$ .

6.4 After 30 min, slowly open the bottle cap to release the internal pressure, to prevent the bottle from bursting. Then retighten the cap.

**Warning: When performing test procedure 6.4, wear protective gloves and mask.**

6.5 After  $20\text{ h}\pm 0.5\text{ h}$ , take the bottle out of the electrothermal blowing drying oven; cool it to room temperature.

6.6 Pour water into a polyethylene cup (5.6); use an electrical conductivity meter (5.1) to measure the electrical conductivity at  $25\text{ }^{\circ}\text{C}$ .

6.7 Without adding test portion, according to the same steps, use the same water to carry out the blank test.

## 7 Expression of results

Calculate the electrical conductivity  $\gamma$  of the aqueous extract according to formula (1), expressed in microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ):

$$\gamma = \gamma_{\text{S}} - \gamma_{\text{B}} \quad \dots\dots\dots (1)$$

Where:

$\gamma_{\text{S}}$  - Indicated value of electrical conductivity of aqueous extract of test portion, in microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ );

$\gamma_{\text{B}}$  - Indicated value of electrical conductivity of blank test, in microsiemens per

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