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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 41928-2022

Plastics - Epoxy resins - Determination of degree of crosslinking of crosslinked epoxy resins by differential scanning calorimetry(DSC)

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foreword

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

drafting.

This document is equivalent to ISO 14322.2018 "Plastic Epoxy Resin Differential Scanning Calorimetry (DSC) Determination of Cross-linked Epoxy Resin Cross-linking Calorimetry"

Liandu".

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document describes the use of Differential Scanning Calorimetry (DSC) to measure the heat of reaction generated during the crosslinking of epoxy resins and calculates based on the results.

The method of calculating the degree of crosslinking.

This document applies to epoxy resin systems with moderate or slow crosslinking reactions.

This document is not applicable to systems with fast crosslinking reactions at room temperature.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is

applicable to

this document.

ISO 11357-1 Plastics Differential Scanning Calorimetry (DSC) Part 1.General [Plastics-Differentialscanning

Note. GB/T 19466.1-2004 Plastic Differential Scanning Calorimetry (DSC) Part 1.General Rules (ISO 11357-1.1997, IDT)

ISO 11409 Determination of heat of reaction and reaction temperature of plastic phenolic resins by differential scanning calorimetry (Plastics-Phenolic

Note. GB/T 32681-2016 Determination of reaction heat and reaction temperature by differential scanning calorimeter method for plastic phenolic resin (ISO 11409.1993, MOD)

3 Terms and Definitions

The terms and definitions defined in ISO 11357-1 and the following apply to this document.

3.1

degree of crosslinking

Indicates the degree of crosslinking reaction of the epoxy resin system.

Note. Expressed as a percentage, calculated according to formula (2) in Chapter 8.

3.2

Epoxy resin, curing agent and accelerator are uniformly mixed together, and the glue system before any reaction occurs.

3.3

total heat of reaction totalheatofreaction

The total amount of reaction heat generated during the completion of crosslinking of an uncrosslinked epoxy resin system (see 3.2) as determined by DSC.

Note. expressed in joules per gram (J.g-1).

4 principles

The total heat of reaction was first measured by DSC for the uncrosslinked epoxy resin system samples. Curve A in Figure 1 is this DSC test curve