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BSI Standards Publication

Plastics — Thermogravimetry (TG) of polymers

Part 3: Determination of the activation energy using the Ozawa-Friedman plot and analysis of the reaction kinetics

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National foreword

This British Standard is the UK implementation of ISO 11358-3:2021. It supersedes BS ISO 11358-3:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/21, Testing of plastics.

A list of organizations represented on this committee can be obtained on request to its committee manager.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Plastics — Thermogravimetry (TG) of polymers —

Part 3: Determination of the activation energy using the Ozawa-Friedman plot and analysis of the reaction kinetics

Plastiques — Thermogravimétrie (TG) des polymères —

Partie 3: Détermination de l'énergie d'activation à l'aide du graphique d'Ozawa-Friedman et analyse cinétique de la réaction

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 11358-3:2013), which has been technically revised.

The changes compared to the previous edition are as follows:

— the term "conversion" has been deleted;

— a corresponding reference to ISO 11358-2 has been added in Clause 3;

— details of the gas atmosphere in 8.1 and 8.2 have been clarified.

A list of all parts in the ISO 11358 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The Ozawa-Friedman plot (logarithm of the rate of mass loss versus the reciprocal of absolute temperature at a given mass loss) is a derivative method that can be applied to data obtained by any mode of temperature change in thermal analysis; e.g. isothermal, constant heating rate, sample-controlled thermal analysis, temperature jump, and repeated temperature scanning.

If controlled rate thermogravimetry (CRTG) is used to study the decomposition of polymers, the Ozawa-Friedman method is typically applied to the analysis of data obtained by CRTG and also to that obtained by the combined use of isothermal thermogravimetry (iso–TG) with conventional linear heating rate thermogravimetry (LHTG), i.e. using a constant heating rate.

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