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Plastics/rubber — Determination of residual monomers and other organic components by capillary-column gas chromatography —

Part 2: Headspace method

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 13741-2:1988), which has been technically revised.

The main changes are as follows:

— the relative corrective factors for internal standard method in quantitative method are now determined by standard addition method, rather than external standard in previous version;

— added details for the preparation of standard solutions, calibration solutions and sample solutions are described;

— added the specification for automated headspace sampler;

— add Clause 3 Terms and definitions.

A list of all parts in the ISO 13741 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 requirements imposed today by authorities include the assessment of the content of residual monomers and organic volatiles, for health and environmental reasons sometimes down to minute traces.

This document presents a method for the determination by gas chromatography of residual monomers and other organic components in polymer dispersions and lattices. This document provides a method that is in line with present-day requirements for analytical methods and is intended for use instead of ISO 3899, where precise measurements of volatile-matter content are needed. This document also expands the scope to include other volatile organic components than residue monomers.

Since the chromatograms obtained normally contain a series of peaks, it is only possible to determine the content of those volatiles for which response factors have been determined. For the identification of unknown peaks, auxiliary methods like mass spectroscopy or the use of a second GC column with a different polarity are advisable.

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Plastics/rubber — Determination of residual monomers and other organic components by capillary-column gas chromatography —

Part 2: Headspace method

1 Scope

This document specifies a method for the determination of residual monomers and other volatile organic components (unsaturated or saturated) in aqueous polymer dispersions and lattices, as well as in related products by headspace capillary-column gas chromatography (HS-GC).

This document is applicable to the determination of residual monomers and other volatiles, include acrylic and methacrylic esters, butadiene, styrene vinyl acetate, as well as by-products such as ethylbenzene.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 124, *Latex, rubber — Determination of total solids content*

ISO 472, *Plastics — Vocabulary*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Principle

A suitable aliquot of the sample is diluted with water and water-miscible solvent containing internal standard and polymerization inhibitor. The mixture is then introduced into a headspace vial. The vial is allowed to come to thermal equilibrium before a measured quantity of the headspace vapours is introduced into a gas chromatograph. The concentration of residual monomers and other volatiles are determined from relative peak areas comparing to the peak area of the internal standard.

5 Reagents

Unless otherwise stated, use only reagents of recognized analytical grade and only grade 1 water as defined in ISO 3696.

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