International Standard

ISO 8810

Plastics — Determination of residual peroxide — Gas chromatography method

Plastiques — Détermination du peroxyde résiduel — Méthode par chromatographie en phase gazeuse

First edition
2026-05

Reference number
ISO 8810:2026(en)

COPYRIGHT PROTECTED DOCUMENT

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

Published in Switzerland

Contents

Page

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 5, *Physical-chemical properties*.

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.

Introduction

Peroxide has many applications in polymer preparation, such as: used as a degradation agent in the degradation reaction of ultra-high fluidity polypropylene (PP) and a variety of polymers, as a crosslinking agent in polyethylene's (PE) crosslinking reaction, as initiator for free radical polymerization, as a vulcanizing agent for rubber vulcanization, etc. For health reasons and stable product quality, the content of residual peroxide in plastics, especially in peroxide-degraded polypropylene (PP) needs to be determined. Chromatography is the main method for the determination of peroxide.

Plastics — Determination of residual peroxide — Gas chromatography method

WARNING — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine any applicable national regulatory conditions prior to use.

IMPORTANT — It is absolutely essential that tests conducted in accordance with this document be carried out by suitably trained staff.

1 Scope

This document specifies a method for the determination of di-tert-butyl peroxide (DTBP) and 2, 5-Dimethyl-2, 5-di (tert-butylperoxy) hexane (DBPH) in plastics by using gas chromatography.

This document is applicable to the determination of the content of residual peroxides in plastics and their products, which use peroxides as a degradation agent or crosslinking agent during plastics processing, or as an additive during polymerization, thereby remaining in degraded polypropylene, crosslinked polyethylene, polystyrene and other plastics.

NOTE The applicability of this method to other peroxides is possible when the method is validated for each case.

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 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

3 Terms and definitions

No terms and definitions are listed in this document.

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

The test sample is extracted by ultrasonic bath with tetrahydrofuran or other suitable solvent. After the extract solution is cooled, the internal standard is added, and the solution is shaken and filtered. The residual peroxides in the extract solution are determined by gas chromatography (GC) with suitable detection technique.