



**International
Standard**

ISO 4764

**Plastics — Polyols for use in the
production of polyurethanes
— Determination of degree of
unsaturation by using iodine method**

*Plastiques — Polyols pour la production des polyuréthanes —
Détermination du degré de non-saturation par la méthode à l'iode*

**First edition
2024-09**

This document is a preview generated by EMS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Solvents and reagents	2
5.1 Solvents.....	2
5.2 Reagents.....	2
5.2.1 Wijs reagent.....	2
5.2.2 0,1 N sodium thiosulfate solution.....	2
5.2.3 KI solution.....	3
5.2.4 Starch indicator.....	3
6 Apparatus	3
7 Procedure	3
8 Correction	4
9 Degree of unsaturation after correction	4
10 Precision and bias	5
11 Test report	5
Annex A (informative) Correction of effect by additives	6
Annex B (informative) Experimental results using conventional polyols	7
Annex C (informative) Effect of differences of solvent	8
Bibliography	9

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 document 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 12, *Thermosetting materials*.

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

Conventionally, a titration method using mercuric acetate (see ISO 17710) has been used as a method for measuring a polyether polyol for polyurethanes. However, in recent years, the treatment of mercury waste liquid associated with analysis has become a global problem.

This document formulates a measurement method to replace the mercuric acetate method.

This document is a preview generated by EVS

Plastics — Polyols for use in the production of polyurethanes — Determination of degree of unsaturation by using iodine method

1 Scope

This document specifies a method for quantifying the total unsaturation using an addition reaction of the interhalogen compound iodine monochloride (ICl), using glacial acetic acid as a solvent as a method for measuring the total unsaturation of a polyether polyol for polyurethanes. It is not applicable to unsaturated compounds that are conjugated with a carbonyl group, a carboxyl group, or a nitrile group.

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 385, *Laboratory glassware — Burettes*

ISO 472, *Plastics — Vocabulary*

ISO 648, *Laboratory glassware — Single-volume pipettes*

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

ISO 4797, *Laboratory glassware — Boiling flasks with conical ground joints*

ISO 6353-2, *Reagents for chemical analysis — Part 2: Specifications — First series*

ISO 6353-3, *Reagents for chemical analysis — Part 3: Specifications — Second series*

ISO 8655-2, *Piston-operated volumetric apparatus — Part 2: Pipettes*

ISO 8655-3, *Piston-operated volumetric apparatus — Part 3: Burettes*

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

After dissolving the sample in a solvent, the carbon-carbon unsaturated compound in the sample is added with glacial acetic acid solution of iodine monochloride (Wijs reagent) and left in a dark place to add iodine. After completion of the addition reaction, add aqueous solution of potassium iodide, liberate iodine and titrate with a sodium thiosulfate solution. When the colour of the solution turns pale yellow, add a starch solution and titrate until the blue disappears. The degree of unsaturation is calculated from the difference from the blank measured at the same time.