Third edition
2022-09

Indoor air —

Part 3: Determination of formaldehyde and other carbonyl compounds in indoor and test chamber air — Active sampling method

Air intérieur —

Partie 3: Dosage du formaldéhyde et d'autres composés carbonylés dans l'air intérieur et dans l'air des chambres d'essai — Méthode par échantillonnage actif

Reference number
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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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 146, *Air quality*, Subcommittee SC 6, *Indoor air*.

This third edition cancels and replaces the second edition (ISO 16000-3:2011), which has been technically revised.

The main changes are as follows:

— clarification of the suitability of the method for acrolein measurements.

A list of all parts in the ISO 16000 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.

Introduction

This document is intended to be used for characterizing indoor air following the sampling strategy specified in ISO 16000-2. It is applicable to formaldehyde and other carbonyl compounds. It has been tested for 14 aldehydes and ketones. Formaldehyde is the simplest carbonyl compound, with one carbon, one oxygen and two hydrogen atoms. In its monomolecular state, it is a colourless, pungent, reactive gas. It has been used in the production of urea-formaldehyde resins, adhesives, and insulating foams. Emissions from particle (chip) board and wall insulation are the major sources of formaldehyde in indoor air.

Formaldehyde is collected by passing air through a reactive medium that converts the compound to a derivative of lower vapour pressure that is more efficiently retained by the sampler and can be easily analysed. This document determines formaldehyde and other carbonyl compounds by reaction with 2,4 dinitrophenylhydrazine coated on to a sorbent to convert them to their corresponding hydrazones, which can be recovered and measured with high sensitivity, precision, and accuracy. Other carbonyl compounds that may be emitted into air from solvents, adhesives, cosmetics, and other sources can also be determined using this document.

The sampling procedure is based on US EPA method TO-11A[12].

Formaldehyde and certain other carbonyl compounds have a high toxic potential[15].

ISO 16017[7][8] and ISO 12219[2]–[6] also focus on volatile organic compound (VOC) measurements.

Instead of systematic IUPAC nomenclature, traditional names are used in this document. Some equivalent names are:

— acetaldehyde: ethanal;

— acetone: 2-propanone;

— butyraldehyde: butanal;

— capronaldehyde: hexanal;

— formaldehyde: methanal;

— isovaleraldehyde: 3-methylbutanal;

— propionaldehyde: propanal;

— m-tolualdehyde: 3-methylbenzaldehyde;

— o-tolualdehyde: 2-methylbenzaldehyde;

— p-tolualdehyde: 4-methylbenzaldehyde;

— valeraldehyde: pentanal.