INTERNATIONAL STANDARD

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Second edition
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Cigarettes — Determination of benzo[a]pyrene in cigarette mainstream smoke using GC/MS — Part 1: Method using methanol as extraction solvent

Cigarettes — Dosage du benzo[a]pyrène dans le courant principal de la fumée de cigarette par CG/SM — Partie 1: Méthode utilisant du méthanol comme solvant d'extraction

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products.*

This second edition cancels and replaces the first edition (ISO 22634-1:2017), which has been technically revised.

The main changes compared to the previous edition are as follows:

— repeatability (r) and reproducibility (R) for B[a]P (ng/cigarette) have been revised;

— reagents have been modified by adding helium;

— storage of standard solutions has been modified;

— shaker and filtration apparatus has been added;

— Bibliography has been extended.

A list of all parts in the ISO 22634 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

Between 1999 and 2003, a task force composed of Cooperation Centre for Scientific Research Relative to Tobacco (CORESTA) members studied the existing methodologies for the determination of benzo[a] pyrene (B[a]P) in the mainstream smoke of cigarettes. Several methods have been proposed for this determination, which are mainly based on two types of analytical methodology: high performance liquid chromatography (HPLC) with fluorescence detection and gas chromatography/mass spectrometry (GC/MS). In both cases, it is necessary to purify the total particulate matter (TPM) extract before performing the chromatography in order to obtain a correct separation of the B[a]P peak.

The task force decided, in the first instance, to develop a method using HPLC with fluorescence detection. However, after several collaborative experiments, it appeared that achieving a significant reduction of the initially observed variability would be technically very difficult. The task force then decided to investigate a GC/MS method as an alternative and was able to demonstrate, through collaborative experiments, that a lower variability can be obtained with this methodology.

This document, produced through collaborative experiments involving many laboratories in many countries, provides a procedure for the determination of B[a]P in cigarette mainstream smoke. The repeatability and reproducibility of this method have been assessed according to ISO recommendations and are included.

No machine smoking regime can represent all human smoking behaviours:

— It is recommended that cigarettes also be tested under conditions of a different intensity of machine smoking than those specified in this document.

— Machine smoking testing is useful to characterize cigarette emissions for design and regulatory purposes, but communication of machine measurements to smokers can result in misunderstandings about differences in exposure and risk across brands.

— smoke emission data from machine measurements may be used as inputs for product hazard assessment, but they are not intended to be nor are they valid measures of human exposure or risks. Communicating differences between products in machine measurements as differences in exposure or risk is a misuse of testing using ISO standards.