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Workplace air — Determination of metals and metalloids in airborne particulate matter by inductively coupled plasma mass spectrometry

~~Second edition~~

~~Date: 2024-11-13~~

Air des lieux de travail — Détermination des métaux et métalloïdes dans les particules en suspension dans l'air par spectrométrie de masse avec plasma à couplage inductif

FDIS stage

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

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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~~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).

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This document was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 2, *Workplace atmospheres*.

This second edition cancels and replaces the first edition (ISO 30011:2010), which has been technically revised.

The main changes are as follows:

— ~~—~~references and definitions have been updated;

— ~~—~~data in Tables 2~~Tables 2~~ and 4 have been updated;

— ~~—~~a new Annex B~~Annex B~~ has been added containing example instrument operating parameters for standard and collision modes~~;~~ (the previous Annexes B~~Annexes B~~ and C~~C~~ have been renumbered as Annexes C~~Annexes C~~ and D~~D~~, respectively~~;~~);

— ~~—~~a new Annex E~~Annex E~~ has been added containing substrate-specific detection and quantification data~~;~~.

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

The health of workers in many industries is at risk through exposure by inhalation of toxic metals and metalloids. Industrial hygienists and other public health professionals need to determine the effectiveness of measures taken to control workers' exposure, and this is generally achieved by taking workplace air measurements. This document has been published in order to make available a method for making valid ultra-trace exposure measurements for a wide range of metals and metalloids in use in industry. It is intended for:

— agencies concerned with health and safety at work;

— industrial hygienists and other public health professionals;

— analytical laboratories; and

— industrial users of metals and metalloids and their workers.

This document specifies a method for the determination of the mass concentration of metals and metalloids in workplace air using quadrupole inductively coupled plasma mass spectrometry (ICP-MS). For many metals and metalloids, analysis by ICP-MS is advantageous when compared to methods such as inductively coupled plasma atomic emission spectrometry, due to its sensitivity and the presence of fewer spectral interferences.

~~This document gives requirements and test methods for analysis of sample solutions by ICP-MS. Users of this document are referred to ISO 15202-1 for collection of samples of airborne particulate matter and to ISO 15202-2 for procedures for preparing sample solutions for analysis by ICP-MS.~~

The execution of the provisions of this document, and the interpretation of the results obtained, is assumed to be entrusted to appropriately qualified and experienced people.