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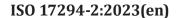
Water quality — Application of inductively coupled plasma mass spectrometry (ICP-MS) —

Part 2:

Determination of selected elements numbers of selected elements and selected elements are not selected elements.

Qualité de l'eau — Application de la spectrométrie de masse avec plasma à couplage inductif (ICP-MS) —

Partie 2: Dosage des éléments sélectionnés y compris les isotopes d'uranium





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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 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 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 230, *Water analysis*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 17294-2:2016), which has been technically revised.

The main changes are as follows:

- with the incorporation of mercury in the previous edition, mercury has now been excluded as a
 hydrolysable and has now become a non-hydrolysable element because it was not in line with the other
 existing standards for the determination of mercury;
- the addition of a modifier has been clarified;
- titanium has been added to the scope.

A list of all parts in the ISO 17294 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.

This corrected version of ISO 17294-2:2023 incorporates the following corrections:

- Note 1 to entry has been moved from the terminological entry <u>3.1.26</u> to <u>3.1.16</u>;
- the symbols "k", " α " and " β " have been revised in 3.2 and the symbols " η " and " σ " have been revised in Tables C.3 and C.5, respectively;
- Clause 12 b) has been editorially revised;
- "204TI" has been changed to "205Tl or ¹⁹³Ir" in Clause A.2;

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- Formula (A.3) has been revised from " $R = r \left(\frac{m_{\rm A}}{m_{\rm B}} \right) \beta$ " to " $R = r \left(\frac{m_{\rm A}}{m_{\rm B}} \right)^{\beta}$ "; the descriptions of symbols "l", "n" and " \bar{x} " have been revised in Table C.5.

Water quality — Application of inductively coupled plasma mass spectrometry (ICP-MS) —

Part 2:

Determination of selected elements including uranium isotopes

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.

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

1 Scope

This document specifies a method for the determination of the elements aluminium, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, caesium, calcium, cerium, chromium, cobalt, copper, dysprosium, erbium, gadolinium, gallium, germanium, gold, hafnium, holmium, indium, iridium, iron, lanthanum, lead, lithium, lutetium, magnesium, manganese, mercury, molybdenum, neodymium, nickel, palladium, phosphorus, platinum, potassium, praseodymium, rubidium, rhenium, rhodium, ruthenium, samarium, scandium, selenium, silver, sodium, strontium, terbium, tellurium, thorium, thallium, tin, titanium, tungsten, uranium and its isotopes, vanadium, yttrium, ytterbium, zinc and zirconium in water (e.g. drinking water, surface water, ground water, waste water and eluates).

Taking into account the specific and additionally occurring interferences, these elements can be determined in water and digests of water and sludge (e.g. digests of water as described in ISO 15587-1 or ISO 15587-2).

The working range depends on the matrix and the interferences encountered. In drinking water and relatively unpolluted waters, the limit of quantification ($L_{\rm OQ}$) lies between 0,002 µg/l and 1,0 µg/l for most elements (see <u>Table 1</u>). The working range typically covers concentrations between several ng/l and mg/l depending on the element and specified requirements.

The quantification limits of most elements are affected by blank contamination and depend predominantly on the laboratory air-handling facilities available on the purity of reagents and the cleanliness of glassware.

The lower limit of quantification is higher in cases where the determination suffers from interferences (see <u>Clause 5</u>) or memory effects (see ISO 17294-1).

Elements other than those mentioned in the scope can also be determined according to this document provided that the user of the document is able to validate the method appropriately (e.g. interferences, sensitivity, repeatability, recovery).