SLOVENSKI STANDARD
oSIST prEN ISO 20899:2026

01-april-2026

Kakovost vode - Plutonij in neptunij - Preskusna metoda z masno spektroskopijo z induktivno sklopljeno plazmo (ICP-MS)

Water quality - Plutonium and neptunium - Test method using ICP-MS

Wasserbeschaffenheit - Plutonium und Neptunium - Verfahren mittels ICP-MS

Qualité de l'eau - Plutonium et neptunium - Méthode d'essai par ICP-MS

Ta slovenski standard je istoveten z: **prEN ISO 20899**

ICS:

13.060.60	Preiskava fizikalnih lastnosti vode	Examination of physical properties of water
13.280	Varstvo pred sevanjem	Radiation protection
17.240	Merjenje sevanja	Radiation measurements

oSIST prEN ISO 20899:2026 **en,fr,de**

DRAFT
International Standard

ISO/DIS 20899

Water quality — Plutonium and neptunium — Test method using ICP-MS

Qualité de l'eau — Plutonium et neptunium — Méthode d'essai par ICP-MS

ICS: 13.060.60; 17.240; 13.280

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Contents

Page

Foreword

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This document was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 3, *Radioactivity measurements*.

This second edition cancels and replaces the first edition (ISO 20899:2018), which has been technically revised.

The main changes are as follows:

— The scope was clarified

— Addition of recommendations regarding potential interferences

— The common SC 3 template for Introduction was implemented

— The common SC 3 template for Test report was implemented

— The bibliographical references were updated

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

Radionuclides are present throughout the environment; thus, water bodies (e.g. surface waters, ground waters, sea waters) contain radionuclides, which can be of either natural or anthropogenic origin:

— Naturally-occurring radionuclides, including ^{3}H, ^{14}C, ^{40}K and those originating from the thorium and uranium decay series, in particular ^{210}Pb, ^{210}Po, ^{222}Rn, ^{226}Ra, ^{228}Ra, ^{227}Ac, ^{232}Th, ^{231}Pa, ^{234}U, and ^{238}U, can be found in water bodies due to either natural processes (e.g., desorption from the soil and runoff by rain water) or released from technological processes involving naturally occurring radioactive materials (e.g. mining, mineral processing, oil, gas, and coal production, water treatment and the production and use of phosphate fertilisers);

— Anthropogenic radionuclides such as ^{55}Fe, ^{59}Ni, ^{60}Co, ^{63}Ni, ^{90}Sr, ^{99}Tc, ^{137}Cs transuranic elements (e.g., Np, Pu, Am, and Cm), and some gamma emitting radionuclides such as ^{60}Co and ^{137}Cs can also be found in natural waters. Small quantities of anthropogenic radionuclides can be discharged from nuclear facilities to the environment as a result of authorized routine releases. The radionuclides present in liquid effluents are usually controlled before being discharged to the environment[1] and water bodies. Anthropogenic radionuclides used for medical and industrial applications can be released to the environment after use. Anthropogenic radionuclides are also found in waters due to contamination from fallout resulting from above-ground nuclear detonations and accidents such as those that have occurred at the Chornobyl and Fukushima nuclear facilities.

Radionuclide activity concentrations in water bodies can vary according to local geological characteristics and climatic conditions and can be locally and temporally enhanced by releases from nuclear facilities during planned, existing, and emergency exposure situations.[2][3] Some drinking water sources can thus contain radionuclides at activity concentrations that can present a human health risk. The World Health Organization (WHO) recommends to routinely monitor radioactivity in drinking waters[4] and to take proper actions when needed to minimize the health risk.

National regulations usually specify the activity concentration limits that are authorized in drinking waters, water bodies, and liquid effluents to be discharged to the environment. These limits can vary for planned, existing, and emergency exposure situations. As an example, during either a planned or existing situation, the WHO guidance level in drinking water are respectively 1 Bq·l−1[4] for ^{239}Pu, ^{240}Pu, ^{237}Np and 10 Bq·l−1[4] for ^{241}Pu, see NOTES 1 and 2. Compliance with these limits is assessed by measuring radioactivity in water samples and by comparing the results obtained, with their associated uncertainties to these limits, as specified by ISO/IEC Guide 98-3 and ISO 5667-20[5],

NOTE 1 If the WHO guidance level is not specified in Annex 6 of Reference [4], the value has been calculated using the formula provided in Reference [4] and the dose coefficient data from References [6] and [7].

NOTE 2 The guidance level calculated in Reference [4] is the activity concentration that results in an effective dose of 0,1 mSv·a^{-1} for members of the public for an intake of 2 l·d^{-1} of drinking water for one year. This is an effective dose that represents a very low level of risk to human health and which is not expected to give rise to any detectable adverse health effects[4].

This document contains method to support laboratories, which need to determine ^{239}Pu, ^{240}Pu, ^{241}Pu and ^{237}Np in water samples. The method described in this document can be used for various types of waters (see Clause 1). Minor modifications such as sample volume and counting time can be made if needed to ensure that the decision threshold, detection limit, and uncertainties are below the required limits. This can be done for several reasons such as emergency situations, lower national guidance limits, and operational requirements.