
Water quality — Strontium 90 and strontium 89 — Test methods using liquid scintillation counting or proportional counting

Qualité de l'eau — Strontium 90 et strontium 89 — Méthodes d'essai par comptage des scintillations en milieu liquide ou par comptage proportionnel



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 13160 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 3, *Radiological methods*.

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WARNING — Persons using this International Standard 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 and to ensure compliance with any national regulatory conditions.

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

1 Scope

This International Standard specifies the test methods and their associated principles for the measurement of the activity of ^{90}Sr in equilibrium with ^{90}Y , and ^{89}Sr , pure beta-emitting radionuclides, in water samples. Different chemical separation methods are presented to produce strontium and yttrium sources, the activity of which is determined using a proportional counter (PC) or liquid scintillation counter (LSC). The selection of the test method depends on the origin of the contamination, the characteristics of the water to be analysed, the required accuracy of test results and the available resources of the laboratories.

These test methods are used for water monitoring following, past or present, accidental or routine, liquid or gaseous discharges. It also covers the monitoring of contamination caused by global fallout.

When fallout occurs immediately following a nuclear accident, the contribution of ^{89}Sr to the total amount of strontium activity is not negligible. This International Standard provides the test methods to determine the activity concentration of ^{90}Sr in presence of ^{89}Sr .

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11929, *Determination of the characteristic limits (decision threshold, detection limit and limits of the confidence interval) for measurements of ionizing radiation — Fundamentals and application*

ISO 80000-10, *Quantities and units — Part 10: Atomic and nuclear physics*

3 Symbols, definitions, and units

For the purposes of this document, the definitions, symbols, and abbreviated terms defined in ISO 11929 and ISO 80000-10 and the following apply.

A_i	calibration source activity of radionuclide i , at the time of calibration	Bq
$c_{A,i}$	activity concentration of radionuclide i	Bq l^{-1}
$c_{A,i}^*$	decision threshold of radionuclide i	Bq l^{-1}
$c_{A,i}^\#$	detection limit of radionuclide i	Bq l^{-1}
$c_{A,i}^{\triangleleft}, c_{A,i}^{\triangleright}$	lower and upper limits of the confidence interval of radionuclide i	Bq l^{-1}