
Pristnost živil - Določanje izotopskih razmerij $^{18}\text{O}/^{16}\text{O}$ v tekočih vodnih živilskih matricah z metodo ravnotežne izotopske razmerne masne spektrometrije (Eq-IRMS)

Food authenticity - Determination of $^{18}\text{O}/^{16}\text{O}$ isotope ratios in liquid aqueous food matrices by Equilibration - Isotope Ratio Mass Spectrometry (Eq-IRMS)

Lebensmittelauthentizität - Bestimmung des $^{18}\text{O}/^{16}\text{O}$ -Isotopenverhältnisses in flüssigen, wässrigen Lebensmittelmatrizes durch Equilibrations-Isotopenverhältnis-Massenspektrometrie (Eq-IRMS)

Authenticité des aliments - Détermination des rapports isotopiques $^{18}\text{O}/^{16}\text{O}$ dans les matrices alimentaires liquides aqueuses par spectrométrie de masse des rapports isotopiques après équilibrage (Eq-SMRI)

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67.050

Splošne preskusne in
analizne metode za živilske
proizvode

General methods of tests and
analysis for food products

oSIST prEN 18337:2026

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EUROPEAN STANDARD
NORME EUROPÉENNE
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DRAFT
prEN 18337

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English Version

Food authenticity - Determination of $^{18}\text{O}/^{16}\text{O}$ isotope ratios in liquid aqueous food matrices by Equilibration - Isotope Ratio Mass Spectrometry (Eq-IRMS)

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isotopiques $^{18}\text{O}/^{16}\text{O}$ dans les matrices alimentaires
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Isotopenverhältnisses in flüssigen, wässrigen
Lebensmittelmatrizes durch Equilibrations-
Isotopenverhältnis-Massenspektrometrie (Eq-IRMS)

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European foreword

This document (prEN 18337:2026) has been prepared by Technical Committee CEN/TC 460 “Food Authenticity”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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Introduction

This document concerns an instrumental method for the determination of oxygen isotope delta values in liquid, aqueous food matrices.

The stable isotope ratio of oxygen usually is expressed as an isotope delta value (δ) which is the ratio of the heavier isotope (^{18}O) to the lighter isotope (^{16}O) in a particular sample relative to the same ratio within an agreed reference.

Originally, the method was developed for the analysis of pure water samples, but the suitability to food matrices has been shown in numerous publications. [1, 2, 3]¹

For the determination of the $^{18}\text{O}/^{16}\text{O}$ isotope ratio in wine and must, the “*Method for $^{18}\text{O}/^{16}\text{O}$ isotope ratio determination of water in wines and must*” (OIV-MA-AS2-12) as well as for grape juice the “*Method for $^{18}\text{O}/^{16}\text{O}$ isotopic ratio determination of water in grape juice (Resolution OIV-OENO 662H-2022)*” are available as reference methods of the Organisation Internationale de la Vigne et du Vin (OIV). [3]

Oxygen stable isotope ratios in the aqueous fraction of food samples can provide information regarding the procedural or geographic origin of food. It has the potential to reveal information on adulteration such as watering or mislabelling of the geographic origin.

As the setup of the required apparatus depends to a large extent on its design principles and the specific recommendations by the manufacturers which have to be followed, it is intended to serve as a frame in which the analysts can define their own analytical work in accordance with the standard procedure.

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¹ Numbers in square brackets refer to the Bibliography.

1 Scope

This document specifies a method for instrumental analysis by equilibration-isotope ratio mass spectrometry (Eq-IRMS) of liquid, aqueous food matrices to determine $^{18}\text{O}/^{16}\text{O}$ isotope ratios of the water of the product. The $^{18}\text{O}/^{16}\text{O}$ isotope ratios obtained by following this document are expressed as $\delta^{18}\text{O}$ values relative to internationally recognized reference materials (RM).

This document does not apply to sample preparation. It is assumed that the food sample has been pre-treated as necessary and homogenized.

Similarly, the interpretation of the obtained $\delta^{18}\text{O}$ values is not covered by this document. Following this protocol will result only in isotope delta values for the sample materials.

Although other instrumental techniques can be applied to determine $\delta^{18}\text{O}$ values in liquid, aqueous food materials, these other techniques are not covered by this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 isotope delta value

δ

stable isotope ratio of a material expressed relative to a reference

Note 1 to entry: For carbon, this expression is given in Formula (1):

$$\delta_{\text{ref}} \left(^{13}\text{C} / ^{12}\text{C} \right) (\text{sample}) = \frac{R_{\text{sample}} \left(^{13}\text{C} / ^{12}\text{C} \right)}{R_{\text{ref}} \left(^{13}\text{C} / ^{12}\text{C} \right)} - 1 \quad (1)$$

Note 2 to entry: The term $\delta_{\text{ref}}(^{13}\text{C}/^{12}\text{C})$ is often changed from the IUPAC format to $\delta^1\text{C}_{\text{ref}}$. This document uses the IUPAC format for familiarity.

Note 3 to entry: To ensure international comparability of isotope delta values, a common reference is used; this reference is an international measurement standard assigned by convention with an isotope delta value exactly equal to zero.

Note 4 to entry: Carbon isotope delta values for natural isotopic abundance in food materials are small and expressed in permille (‰) rather than in their native form.

[SOURCE: EN 17958:2024, 3.1]