
International Standard



6058

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Water quality — Determination of calcium content — EDTA titrimetric method

Qualité de l'eau — Dosage du calcium — Méthode titrimétrique à l'EDTA

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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 developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6058 was developed by Technical Committee ISO/TC 147, *Water quality*, and was circulated to the member bodies in January 1983.

It has been approved by the member bodies of the following countries:

Australia	Hungary	Poland
Austria	India	Romania
Belgium	Iran	South Africa Rep. of
Brazil	Iraq	Spain
Canada	Italy	Sweden
China	Japan	Switzerland
Czechoslovakia	Korea, Dem. P. Rep. of	Thailand
Denmark	Korea, Rep. of	United Kingdom
Finland	Netherlands	USSR
France	New Zealand	
Germany, F. R.	Norway	

No member body expressed disapproval of the document.

Water quality — Determination of calcium content — EDTA titrimetric method

1 Scope and field of application

This International Standard specifies a titrimetric method using ethylenediaminetetraacetic acid (EDTA) for the determination of the calcium content of ground waters, surface waters and drinking waters. It can also be used for municipal and industrial raw waters, provided they do not contain interfering amounts of heavy metals.

The method is not applicable to sea waters and other similar waters with a high concentration of salts. It is applicable to waters with calcium contents ranging from 2 to 100 mg/l (0,05 to 2,5 mmol/l).

For waters containing more calcium than 100 mg/l, a diluted sample shall be used.

2 References

ISO 385/1, *Laboratory glassware — Burettes — Part 1: General requirements.*¹⁾

ISO 5667, *Water quality — Sampling —*

Part 1: Guidance on the design of sampling programmes.

Part 2: Guidance on sampling techniques.

*Part 3: Guidance on the preservation and handling of samples.*²⁾

3 Principle

Complexometric titration of calcium ions with an aqueous solution of the disodium salt of EDTA at a pH value of between 12 and 13. HSN, which forms a red complex with calcium, is used as the indicator. Magnesium is precipitated as the hydroxide and does not interfere with the determination.

In the titration, the EDTA first reacts with the free calcium ions and then with the calcium ions combined with the indicator. The indicator then changes its colour from red to bright blue.

4 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

4.1 Sodium hydroxide, 2 mol/l, solution.

Dissolve 8 g of sodium hydroxide in 100 ml of freshly distilled water. Store in a polyethylene bottle.

NOTE — Take precautions to avoid contamination by atmospheric carbon dioxide.

4.2 EDTA, standard volumetric solution, $c(\text{Na}_2\text{EDTA}) \approx 10 \text{ mmol/l}$.

4.2.1 Preparation

Dry a portion of the disodium salt of EDTA dihydrate ($\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_8\text{Na}_2 \cdot 2\text{H}_2\text{O}$) at 80 °C for 2 h, dissolve 3,725 g of the dry salt in water and dilute to 1 000 ml in a volumetric flask.

Store the EDTA solution in a polyethylene bottle and check the concentration at regular intervals.

4.2.2 Standardization

Standardize the solution (4.2.1) against the calcium standard reference solution (4.3) by the procedure described in clause 7.

Use 20,0 ml of the calcium standard reference solution (4.3) and dilute to 50 ml.

4.2.3 Calculation of the concentration

The concentration of the EDTA solution, c_1 , expressed in millimoles per litre, is given by the equation

$$c_1 = \frac{c_2 V_1}{V_2}$$

1) At present at the stage of draft. (Partial revision of ISO/R 385-1964.)

2) At present at the stage of draft.