INTERNATIONAL STANDARD

ISO 2174

Third edition
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Surface active agents — Preparation of water with known calcium hardness

Agents de surface — Préparation d'une eau de dureté calcique déterminée

Reference number
ISO 2174 : 1990 (E)

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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2174 was prepared by Technical Committee ISO/TC 91, *Surface active agents.*

This third edition cancels and replaces the second edition (ISO 2174 : 1979), of which it constitutes a minor revision.

Annex A of this International Standard is for information only.

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Surface active agents — Preparation of water with known calcium hardness

1 Scope

1.1 This International Standard specifies a method of preparing water of known calcium hardness for use in testing surface active agents and products containing them.

1.2 Systematic investigations have shown that, in many tests on surface active agents with hard water, there is no essential difference between calcium hardness and magnesium hardness, so that these tests can usually be carried out with an aqueous solution of calcium chloride of known hardness.

If, in certain cases, it is necessary to use other ions that give rise to the hardness of water, this fact shall be mentioned in the test report.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 385-1 : 1984, *Laboratory glassware — Burettes — Part 1: General requirements.*

ISO 648 : 1977, *Laboratory glassware — One-mark pipettes.*

ISO 1042 : 1983, *Laboratory glassware — One-mark volumetric flasks.*

ISO 1773 : 1976, *Laboratory glassware — Boiling flasks (narrow-necked).*

ISO 3696 : 1987, *Water for analytical laboratory use — Specification and test methods.*

3 Definition

For the purposes of this International Standard, the following definition applies.

water hardness: The property resulting from the presence of calcium and magnesium salts and, in special cases, salts of strontium and/or barium.

The unit of measurement of water hardness is the millimole per litre (mmol/l). 1 mmol/l of calcium hardness corresponds to 40,08 mg of calcium ions per litre.

The equivalents for other degrees of hardness of water, as well as other units used for measuring water hardness and the relationships between them, are given for information in annex A.

NOTE — Originally, the hardness of a sample of water was determined by measuring its power to destroy the foam formed by soap. This property is primarily due to the presence of calcium and magnesium, but salts of other metals, such as iron, aluminium and manganese, behave in a similar manner, although these seldom occur in natural waters.

4 Principle

Preparation of a stock solution by dissolving an appropriate quantity of calcium chloride in water. Determination of the calcium in this stock solution by complexometric titration with the disodium salt of (ethylenedinitrilo)tetraacetic acid (EDTA) using a mixture of Mordant Black 11 (C.I. 14645) and methyl red as indicator.

Preparation of dilute solutions, of the hardness required, by dilution of appropriate volumes of the stock solution.

5 Reagents

All reagents shall be of recognized analytical grade and the water used shall be grade 3 as defined in ISO 3696.

5.1 Calcium chloride dihydrate ($CaCl_2.2H_2O$).

If the dihydrate is not available, use an equivalent quantity of another hydrate or the anhydrous salt.