

INTERNATIONAL STANDARD

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Surface active agents — Detergents — Determination of anionic-active matter by manual or mechanical direct two-phase titration procedure

*Agents de surface — Détergents — Détermination de la teneur en matière active
anionique selon une méthode manuelle ou mécanique par titrage direct
dans deux phases*



Reference number
ISO 2271 : 1989 (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 2271 was prepared by Technical Committee ISO/TC 91, *Surface active agents*.

This second edition cancels and replaces the first edition (ISO 2271 : 1972), of which it constitutes a minor revision.

Annex A of this International Standard is for information only.

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Surface active agents — Detergents — Determination of anionic-active matter by manual or mechanical direct two-phase titration procedure

1 Scope

This International Standard specifies a manual or mechanical method for the determination of anionic-active matter present in detergents.

The method is applicable to solids or to aqueous solutions of the active material. The relative molecular mass of the anionic active matter has to be known.

The method is not applicable if cationic surface active agents are present.

The manual method is thus applicable to the determination of alkylbenzene sulfonates; alkane sulfonates, sulfates and hydroxysulfates; alkylphenol sulfates; fatty alcohol methoxy- and ethoxysulfates; dialkylsulfosuccinates and other active materials containing one hydrophilic group per molecule.

The mechanical method is applicable to all the above-mentioned products provided it gives results comparable with those obtained using the manual method.

NOTE — Low relative molecular mass sulfonates present as hydrotropes (toluene, xylene) do not interfere when present in concentrations of up to 15 % (*m/m*) relative to the active matter. At higher levels, their influence should be evaluated in each particular case.

Soap, urea and salts of (ethylenedinitrilo)tetraacetic acid do not interfere.

In the presence of non-ionic surface agents, their influence should be evaluated in each particular case.

Typical inorganic components of detergent formulations, such as sodium chloride, sulfates, borates, tripolyphosphates, perborates, silicates, etc., do not interfere, but bleaching agents other than perborate should be destroyed before the analysis, and the sample should be completely soluble in water.

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 listed 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 607 : 1980, *Surface active agents and detergents — Methods of sample division.*

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

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

3 Principle

Determination of the anionic-active matter in a medium consisting of an aqueous and a chloroform phase by titration with a standard volumetric cationic-active solution (benzethonium chloride) in the presence of an indicator which consists of a mixture of a cationic dye (dimidium bromide) and an anionic dye (acid blue 1).

NOTE — The chemical process is as follows: the anionic-active matter forms a salt with the cationic dye which dissolves in the chloroform to give this layer a reddish pink colour.

In the course of the titration, the benzethonium chloride displaces the dimidium bromide from this salt and the pink colour disappears from the chloroform layer as the dye passes into the aqueous phase. Excess benzethonium chloride forms a salt with the anionic dye, which dissolves in the chloroform layer and colours it blue.

4 Reagents

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

4.1 Chloroform, ρ_{20} 1,48 g/ml, distilling between 59,5 °C and 61,5 °C.

4.2 Sulfuric acid, approximately 245 g/l solution.

Carefully add 134 ml of sulfuric acid, ρ_{20} 1,83 g/ml, to 300 ml of water and dilute to 1 litre.

4.3 Sulfuric acid, standard volumetric solution, $c(1/2 \text{ H}_2\text{SO}_4) = 1,0 \text{ mol/l}$.

4.4 Sodium hydroxide, standard volumetric solution, $c(\text{NaOH}) = 1,0 \text{ mol/l}$.