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INTERNATIONAL STANDARD

ISO 2270

Second edition
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Non-ionic surface active agents — Polyethoxylated derivatives — Iodometric determination of oxyethylene groups

Agents de surface non ioniques — Dérivés polyéthoxylés — Dosage iodométrique des groupes oxyéthylène

Reference numbe
ISO 2270 : 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 2270 was prepared by Technical Committee ISO/TC 91, *Surface active agents.*

This second edition cancels and replaces the first edition (ISO 2270 : 1972), of which it constitutes a minor revision.

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ISO 2270 : 1989 (E)

Non-ionic surface active agents — Polyethoxylated derivatives — Iodometric determination of oxyethylene groups

1 Scope

This International Standard specifies a method for the iodometric determination of oxyethylene groups in polyethoxylated non-ionic surface active agents.

The method is applicable to the analysis of polyethoxylated derivatives of

- primary saturated fatty alcohols;
- oleyl alcohol;
- saturated fatty acids;
- straight and branched chain alkylphenols.

It is also applicable in the presence of unreacted alcohols, fatty acids or alkylphenols of the types mentioned above.

The method is not applicable in the presence of

- compounds containing sulfur or nitrogen;
- compounds containing oxygen or halogen atoms on adjacent carbon atoms other than as oxyethylene groups, for example compounds containing oxypropylene groups;
- aldehydes or acetals;
- sterols and derivatives.

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 383 : 1976, *Laboratory glassware — Interchangeable conical ground glass joints.*

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

3 Principle

Hydrolysis of the oxyethylene groups by nascent hydriodic acid.

Liberation of the iodine and titration with a standard volumetric sodium thiosulfate solution.

4 Reactions

The basic reaction is the conversion of each (CH_2-CH_2O) group to ethylene di-iodide (ICH_2-CH_2I), in accordance with the equation

$$RO\text{-}(CH_2\text{-}CH_2O)_nH + 2nHI \rightarrow nICH_2\text{-}CH_2I + ROH + nH_2O$$

The unstable ethylene di-iodide is then decomposed on heating:

$$ICH_2\text{-}CH_2I \rightarrow C_2H_4 + I_2$$

NOTE — If R is an alkyl radical, ROH will be converted to RI. Some of the ethylene groups (and all of any oleyl alcohol present) will react with HI to form a stable iodide.

5 Reagents

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

5.1 Nitrogen or carbon dioxide.

5.2 Potassium iodide, crystals, minimum purity 99,5 %.

5.3 Phosphoric acid, ϱ_{20} approximately 1,70 g/ml.

5.4 Methanol, ϱ_{20} 0,79 g/ml.

5.5 Potassium iodide, 100 g/l solution.

5.6 Sodium thiosulfate, standard volumetric solution, $c(Na_2S_2O_3)$ = 0,1 mol/l.