INTERNATIONAL STANDARD 4321

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Washing powders — Determination of active oxygen content — Titrimetric method

Poudres à laver — Dosage de l'oxygène actif — Méthode titrimétrique

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FOREWORD

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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 4321 was developed by Technical Committee ISO/TC 91, *Surface active agents*, and was circulated to the member bodies in August 1975.

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

Australia	Iran	Switzerland
Austria	Italy	Thailand
Belgium	Japan	Turkey
Canada	Netherlands	United Kingdom
Egypt, Arab Rep. of	New Zealand	U.S.A.
France	Poland	U.S.S.R.
Germany	Romania	Yugoslavia
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India	Spain	

No member body expressed disapproval of the document.

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Washing powders — Determination of active oxygen content — Titrimetric method

0 INTRODUCTION

Because of the specificity of washing powders and the relative stability of peroxyhydrates, the dissolution of washing powders is likely to be incomplete and may result in a loss of oxygen; these disadvantages have been avoided by adoption of a particular method of dissolution appropriate to the determination of active oxygen content.

1 SCOPE

This International Standard specifies a method for the determination of the active oxygen content of commercial washing powders.

2 FIELD OF APPLICATION

This method may be used for determining peroxyhydrates, for example sodium perborate; it should not be used for washing powders which contain, in addition to peroxyhydrates, products which react with acid permanganates under the analytical conditions.

The method may be used in the presence of (ethylenedinitrilo)tetraacetic acid (EDTA) or other chelating agents of the same type, provided that the concentration of these products does not exceed 1 % (*m/m*).

3 REFERENCE

ISO 607, *Surface active agents — Detergents — Methods of sample division*.[1]

4 PRINCIPLE

Co-reduction, with liberation of oxygen, of the peroxyhydrate and potassium permanganate in an acid solution.

NOTES

1 The relatively long induction period that may occur with certain washing powders may be avoided by adding manganese sulphate.

2 Bismuth nitrate complexes with the EDTA or with any other amine acetate-based chelating agent, thus removing all possible interference.

3 If aluminium sulphate is added, a preferential reaction with the condensed phosphates may be obtained and the formation of a complex with the manganese ions, which may occur in certain cases and which may lead to an end-point that is not sharp, may be avoided.

5 REAGENTS

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

5.1 Aluminium sulphate, octadecahydrate $[Al_2(SO_4)_3.18H_2O]$.

5.2 Sulphuric acid, solution containing bismuth and manganese.

Dissolve 2 g of bismuth nitrate pentahydrate $[Bi(NO_3)_3.5H_2O]$ and 4 g of manganese sulphate monohydrate ($MnSO_4.H_2O$) [or an equivalent quantity of tetra- or pentahydrate ($MnSO_4.4H_2O$ or $MnSO_4.5H_2O$)] in 1 000 ml of a 5 N sulphuric acid solution.

5.3 (If necessary) **Sulphuric acid,** solution containing aluminium, bismuth and manganese.

Dissolve 50 g of the aluminium sulphate (5.1), 5 g of bismuth nitrate pentahydrate and 5 g of manganese sulphate monohydrate in 1 000 ml of a 5 N sulphuric acid solution.

5.4 Potassium permanganate ($KMnO_4$), freshly standardized, approximately 0,1 N standard volumetric solution.

6 APPARATUS

Ordinary laboratory apparatus and

6.1 One-mark volumetric flask, of capacity 1 000 ml, complying with the requirements of ISO 1042.

6.2 Conical flask, of capacity 500 ml, complying with the requirements of ISO 1773.

6.3 Mechanical stirrer.

1) In preparation. (Revision of ISO/R 607.)