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BRITISH STANDARD

BS 3762-3.18: 1986

Analysis of formulated detergents —

Part 3: Quantitative test methods —

Section 3.18 Method for determination of chlorine oxidizing agents content

NOTE It is recommended that this Section be read in conjunction with the information in the "*General Introduction*", published separately as BS 3762-0.

Confirmed November 2008

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Foreword

This Section of BS 3762 has been prepared under the direction of the Chemicals Standards Committee and supersedes section II of method D9 of BS 3762:1964.

This standard describes a method of test only and should not be referred to as a specification defining limits of purity. Reference to the standard should indicate that the method of test used is in conformity with BS 3762-3.18.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been prepared under the direction of the Chemicals Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 December 1985

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The committees responsible for this British Standard are shown in Part 0.
The following BSI references relate to the work on this standard:
Committee reference CIC/34
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Amendments issued since publication

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1 Scope

This Section of BS 3762 describes a method for the determination of chlorine oxidizing agents in detergent formulations. The presence of other oxidizing agents may interfere.

NOTE The titles of the publications referred to in this Section are listed on the inside back cover.

2 Principle

Potassium iodide is added to the sample. Any chlorine oxidizing agents react with this to yield iodine. The liberated iodine is determined by visual or potentiometric titration with standard volumetric sodium thiosulphate solution. Results are expressed as available chlorine.

3 Reagents

The reagents shall be of a recognized analytical grade. Water complying with BS 3978 shall be used throughout.

3.1 *Potassium iodide*

3.2 *Sulphuric acid solution,* $c(H_2SO_4) = 5$ mol/L approximately.

3.3 *Sodium thiosulphate solution,* $c(Na_2S_2O_3) = 0.100$ mol/L.

3.4 *Starch indicator*, 10 g/L solution, freshly prepared.

4 Apparatus

Ordinary laboratory apparatus, the apparatus described in **4.1** and, if potentiometric titration is used, the apparatus detailed in **4.2** to **4.4** are required.

4.1 *One-mark volumetric flask*, of 250 mL capacity, complying with class B of BS 1792.

4.2 *pH meter (complying with BS 3145) or other apparatus suitable for potentiometric titration*

4.3 *Platinum electrode*

4.4 *Calomel reference electrode*

5 Procedure

5.1 Test portion

Weigh, to the nearest 0.05 g, approximately 10 g of sample into a 250 mL beaker. Add 150 mL of water and stir to dissolve. Transfer to the 250 mL one-mark volumetric flask (**4.1**) and dilute to the mark with water.

Transfer an aliquot portion of this solution to a 250 mL conical flask as follows.

Available chlorine content	Aliquot volume
% (*m*/*m*)	(mL)
0 to 2	100
2 to 5	50
5 to 10	25

Adjust the total volume in the flask to approximately 100 mL by addition of water.

Weigh approximately 2 g of the potassium iodide (**3.1**) and add to the flask. Add 10 mL of the sulphuric acid solution (**3.2**). Titrate with the sodium thiosulphate solution (**3.3**) either visually or potentiometrically as described in **5.2** or **5.3**, respectively.

5.2 Visual titration

Titrate with the sodium thiosulphate solution until the iodine colour is almost gone. Add 1 mL of the starch indicator solution (**3.4**) and complete the titration to the disappearance of the blue colour. Record the titration volume, *T*.

5.3 Potentiometric titration

Introduce the platinum and reference electrodes (**4.3** and **4.4**) connected to the pH meter (**4.2**) and, while stirring, titrate with the sodium thiosulphate solution.

Plot a graph of millivolts or pH scale readings against millilitres of the sodium thiosulphate solution. Read off the volume, *T*, in millilitres corresponding to the steepest part of the graph.

6 Calculation

The oxidizing agents content, expressed as a percentage by mass of available chlorine, is given by the following expression.

$$\frac{T \times 0.1 \times 35.5 \times 100}{m \times 1000 \times A} \times 250$$

$$= \frac{T \times 88.75}{m \times A}$$

where

T is the volume of the sodium thiosulphate solution (in mL);

m is the mass of the test portion (in g);

A is the volume of the aliquot portion taken in **5.1** (in mL).

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7 Test report

The test report shall include the following information:

a) a reference to this British Standard, i.e. BS 3762-3.18;

b) the results and the method of expression used.

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Publications referred to

BS 1792, *Specification for one-mark volumetric flasks.*
BS 3145, *Specification for laboratory pH meters.*
BS 3978, *Water for laboratory use.*

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