BRITISH STANDARD

BS 4651-5: 1988

Ammonia solution —

Part 5: Method for determination of iron content

NOTE It is recommended that this Part be read in conjunction with the information on methods for sampling in BS 4651-0, published separately.

UDC 546.171.1 – 145.2:543.73:546.72:543.42.062

Foreword

This Part of BS 4651 has been prepared under the direction of the Chemicals Standards Committee and supersedes clause **5** of BS 4651:1971 which is withdrawn. This method refers largely to BS 6337-3:1983, possession of which is essential.

NOTE The term "ammonia solution" is used to describe grades of product containing 25.0 % to 35.0 % (*m*/*m*) ammonia.

WARNING. Ammonia solution is a moderately strong alkali which exerts a local irritant action on the skin. Strong solutions which come into contact with the eyes, even for a short period, can cause serious and permanent damage.

Ingestion of ammonia solution will result in the destruction of the mucous lining of the mouth, throat and stomach.

Ammonia vapour is readily released from ammonia solution and is combustible in air between the concentrations of 16 % and 27 % (*V*/*V*) and may explode in confined spaces.

When sampling ammonia solution, take the precautions described in BS 4651-0.

This Part of BS 4651 describes a method of test only and should not be used or quoted as a specification defining limits of purity. Reference to this Part should indicate that the method of test used complies with BS 4651-5:1988.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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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 August 1988

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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/21
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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.

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

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1 Scope

This Part of BS 4651 describes a spectrometric method for determination of the iron content of ammonia solution for industrial use. The method is applicable to products having iron contents between 0.2 mg/kg and 10.0 mg/kg.

NOTE The publications referred to in this standard are listed on the inside back cover.

2 Principle

The principle is described in clause **3** of BS 6337-3:1983.

3 Reagents

The reagents described in clause **4** of BS 6337-3:1983 are required. Use water complying with grade 3 of BS 3978.

4 Apparatus

4.1 *General.* The apparatus described in clause **5** of BS 6337-3:1983 and the following are required.

4.2 *Platinum dish,* approximately 75 mL capacity.

4.3 *One-mark volumetric flask,* 50 mL, complying with BS 1792.

5 Procedure

5.1 Test portion

Fill the dry, one-mark volumetric flask (**4.3**) to the mark with the test sample.

5.2 Preparation of test solution

Transfer some of the test portion (**5.1**) into the platinum dish (**4.2**) and place it on a boiling water bath in a well-ventilated fume cupboard. Carefully evaporate the solution, adding more of the test portion until the whole of the 50 mL has been used. Rinse the volumetric flask with water and add the rinsings to the platinum dish. Continue the evaporation to dryness. Remove the platinum dish from the water bath as soon as it is dry and allow to cool. Add 5 mL of the hydrochloric acid (see **4.1** of BS 6337-3:1983) and warm to dissolve the residue.

Transfer quantitatively the solution to a beaker and dilute to approximately 50 mL with water.

5.3 Determination

Determine the iron content of the test solution by following the procedure described in clause **6** of BS 6337-3:1983.

6 Calculation and expression of results

Calculate the mass, in μg, of iron in the test solution in accordance with clause **7** of BS 6337-3:1983.

The iron content, in mg/kg, of the ammonia solution is given by the following expression.

$$\frac{(m_1 - m_0)}{50 \times \rho}$$

where

m_0 is the mass of iron found in the blank test (see **6.2** of BS 6337-3:1983) (in μg);

m_1 is the mass of iron found in the test solution (in μg);

50 is the volume of the test portion (**5.1**) (in mL);

ρ is the density of the sample at 20 °C, determined in accordance with BS 4651-1 (in g/mL).

7 Test report

The test report shall include the following information:

a) a reference to this British Standard, i.e. BS 4651-5:1988;

b) a complete identification of the sample;

c) details of any unusual features noted during the determination;

d) the results expressed in accordance with clause **6**;

e) any operation not included in this British Standard or regarded as optional.

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Publications referred to

BS 1792, *Specification for one-mark volumetric flasks.*
BS 3978, *Specification for water for laboratory use.*
BS 4651, *Ammonia solution.*
BS 4651-0, *Methods for sampling.*
BS 4651-1, *Method for determination of density at 20 °C.*
BS 6337, *General methods of chemical analysis.*
BS 6337-3, *Method for determination of iron content (1,10-phenanthroline spectrophotometric method).*

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