

Methods of test for
Desiccants —

**Part 5: Determination of water-soluble
sulphates content**

NOTE It is recommended that this Part be read in conjunction with BS 3482-1 “*Sampling, and preparation and storage of test samples*” which is issued separately.

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Chemicals Standards Policy Committee (CIC/-) to Technical Committee CIC/2, upon which the following bodies were represented:

Chemical Industries Association
 Ministry of Defence
 Royal Society of Chemistry
 Society of British Aerospace Companies Limited
 Society of Environmental Engineers

This British Standard, having been prepared under the direction of the Chemicals Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 31 July 1991

© BSI 10-1999

The following BSI references relate to the work on this standard:
 Committee reference CIC/2
 Draft for comment 90/55565 DC

ISBN 0 580 19701 8

Amendments issued since publication

| Amd. No. | Date | Comments |
|----------|------|----------|
| | | |
| | | |
| | | |
| | | |

Contents

| | Page |
|---|--------------------|
| Committees responsible | Inside front cover |
| Foreword | ii |
| <hr/> | |
| 1 Scope | 1 |
| 2 Principle | 1 |
| 3 Reagents | 1 |
| 4 Apparatus | 1 |
| 5 Preparation of the test sample | 1 |
| 6 Procedure | 1 |
| 7 Calculation and expression of results | 1 |
| 8 Test report | 1 |
| <hr/> | |
| Publication(s) referred to | Inside back cover |

Foreword

This Part of BS 3482 has been prepared under the direction of the Chemicals Standards Policy Committee. This revision of BS 3482 comprises Part 1, which describes procedures for sampling and preparation and storage of test samples and a number of Parts describing methods of test for desiccants. This revision supersedes BS 3482:1962 which is withdrawn. It differs from BS 3482:1962 in that individual methods have been published in separate Parts and have been generally updated. Some additional methods not included in BS 3482:1962 have also been incorporated.

This Part of BS 3482 also supersedes the methods given in Appendix E of BS 2540:1960 and Appendix E of BS 2541:1960 and Appendix D of BS 3523:1962 which are withdrawn.

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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.

1 Scope

This Part of BS 3482 describes a method for the determination of the water-soluble sulphates content of desiccants.

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

2 Principle

Barium sulphate is precipitated and filtered from a test portion of filtered aqueous extract. The residue is heated in an oven until dry.

3 Reagents

3.1 General. Use only reagents of recognized analytical grade and water complying with grade 3 of BS 3978.

3.2 Hydrochloric acid solution, 1 180 g/L.

3.3 Barium chloride solution,
 $c(\text{BaCl}_2) = 10\% \text{ (m/m)}$.

3.4 Silver nitrate solution, $c(\text{AgNO}_3) = 1\% \text{ (m/m)}$.

4 Apparatus

4.1 Ordinary laboratory apparatus and the following are required.

4.2 Filter paper, fine grade, hardened, ashless.

4.3 Oven, capable of being maintained at $110 \pm 5^\circ\text{C}$.

4.4 Muffle furnace, capable of being maintained at $600 \pm 10^\circ\text{C}$.

5 Preparation of the test sample

Prepare at least 400 mL of aqueous extract by the method described in BS 3482-1. Filter the extract through the filter paper (4.2).

6 Procedure

6.1 Test portion

Transfer 50 mL of the test sample to a 250 mL glass beaker.

6.2 Precipitation

Add 2 mL of the hydrochloric acid solution (3.2) to the test portion (6.1), bring to the boil and slowly add 5 mL of the barium chloride solution (3.3). Place the beaker and solution on a boiling water bath for 2 h, then remove and allow to stand for 16 h.

6.3 Determination

Thoroughly mix the precipitate and solution obtained in 6.2, filter through the filter paper (4.1) and wash with 25 mL of water at 70°C . Add to the washings 5 mL of the silver nitrate solution (3.4), check visually the level of turbidity produced, then discard. Repeat the operations of washing and adding silver nitrate solution until no turbidity is seen, i.e. when the washings are free from chlorides.

Heat a crucible in the muffle furnace (4.4) maintained at $600 \pm 10^\circ\text{C}$ for 1 h. Remove and allow to cool in a desiccator. Weigh the crucible to the nearest 0.001 g and record the mass. Transfer the precipitate and filter paper to the crucible and place in the oven (4.3) maintained at $110 \pm 5^\circ\text{C}$ for 1 h. Remove from the oven and carefully char the filter paper using a gentle flame. Do not allow the paper to burst into flame as mechanical loss may occur. Transfer carefully the crucible, filter paper and precipitate to the muffle furnace (4.4) and with a free access of air burn off the carbon. Close the muffle furnace and heat for 1 h. Remove the crucible and contents and allow to cool in a desiccator. Weigh the crucible and contents to the nearest 0.001 g. Repeat the operations of heating at 600°C , cooling and weighing until successive weighings differ by no more than 0.002 g.

7 Calculation and expression of results

Calculate the water-soluble sulphates content, expressed as a percentage by mass as sodium sulphate (Na_2SO_4), from the following expression:

$$12.17 (m_2 - m_1)$$

where:

m_1 is the initial mass of the crucible (in g);

m_2 is the final mass of crucible and precipitate after heating at 600°C (in g).

8 Test report

The test report shall include the following information.

- A complete identification of the sample.
- A reference to this British Standard method, i.e. BS 3482-5:1991.
- The results expressed in accordance with clause 7.
- Any unusual features noted during the determination.

Publication(s) referred to

BS 3482, *Methods of test for desiccants.*

BS 3482-1, *Sampling, and preparation and storage of samples.*

BS 3978, *Specification for water for laboratory use.*

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

If permission is granted, the terms may include royalty payments or a licensing agreement. Details and advice can be obtained from the Copyright Manager. Tel: 020 8996 7070.