

---

---

**General methods of test for pigments  
and extenders —**

**Part 13:  
Determination of water-soluble  
sulphates, chlorides and nitrates**

*Méthodes générales d'essai des pigments et matières de charge —*

*Partie 13: Détermination des sulfates, chlorures et nitrates solubles  
dans l'eau*

Document Preview

[ISO 787-13:2019](https://standards.iteh.ai/catalog/standards/iso/d3ffd1ad-4a5a-44bc-bf90-11ddf6f77ef1/iso-787-13-2019)

<https://standards.iteh.ai/catalog/standards/iso/d3ffd1ad-4a5a-44bc-bf90-11ddf6f77ef1/iso-787-13-2019>



iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

[ISO 787-13:2019](https://standards.iteh.ai/catalog/standards/iso/d3ffd1ad-4a5a-44be-bf90-11ddf6f77ef1/iso-787-13-2019)

<https://standards.iteh.ai/catalog/standards/iso/d3ffd1ad-4a5a-44be-bf90-11ddf6f77ef1/iso-787-13-2019>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword .....	iv
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Reagents</b> .....	<b>1</b>
<b>5 Apparatus</b> .....	<b>2</b>
<b>6 Sampling</b> .....	<b>2</b>
<b>7 Determination of sulphates</b> .....	<b>2</b>
7.1 Procedure .....	2
7.2 Expression of results .....	2
<b>8 Determination of chlorides</b> .....	<b>3</b>
8.1 Procedure .....	3
8.2 Expression of results .....	3
<b>9 Determination of nitrates</b> .....	<b>3</b>
9.1 Procedure .....	3
9.2 Expression of results .....	4
<b>10 Test report</b> .....	<b>4</b>
<b>Bibliography</b> .....	<b>5</b>

iTech Standards  
(<https://standards.itih.ai>)  
Document Preview

[ISO 787-13:2019](https://standards.itih.ai/catalog/standards/iso/d3ffd1ad-4a5a-44bc-bf90-11ddf6f77ef1/iso-787-13-2019)

<https://standards.itih.ai/catalog/standards/iso/d3ffd1ad-4a5a-44bc-bf90-11ddf6f77ef1/iso-787-13-2019>

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 256, *Pigments, dyestuffs and extenders*.

This third edition cancels and replaces the second edition (ISO 787-13:2002), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

- [Clause 3](#) on “Terms and definitions”, with a general reference to ISO 18451-1, has been added;
- CAS numbers have been added to the reagents;
- the bibliography has been added;
- the text has been editorially revised.

A list of all parts in the ISO 787 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# General methods of test for pigments and extenders —

## Part 13:

# Determination of water-soluble sulphates, chlorides and nitrates

## 1 Scope

This document specifies a general method of test for determining the water-soluble sulphates, chlorides and nitrates of pigments.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

ISO 18451-1, *Pigments, dyestuffs and extenders — Terminology — Part 1: General terms*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18451-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Reagents

All reagents used shall be of recognized analytical reagent quality. Distilled water, or water of equivalent purity, shall be used.

**4.1 Hydrochloric acid**,  $\rho = 1,18 \text{ g/cm}^3$  (CAS-No 7647-01-0).

**4.2 Silver nitrate**, 0,01 mol/l standard volumetric solution (CAS-No 7761-88-8).

**4.3 Ammonium chloride solution**, 17,2 mg/l (CAS-No 12125-02-9).

**4.4 Sodium hydroxide solution**, 200 g/l (CAS-No 1310-73-2).

**4.5 Barium chloride solution**, 50 g/l (CAS-No 10361-37-2).

**4.6 Potassium chromate solution**, 50 g/l (CAS-No 7789-00-6).

**4.7 Devarda's alloy**, powdered.

**4.8 Nessler's reagent**, prepared by either method a) or method b) as follows:

- a) Dissolve 5 g of potassium iodide in 3,5 ml of water. Add cold saturated mercury(II) chloride ( $\text{HgCl}_2$ ) solution, while stirring, until a faint red precipitate is formed. Continuing to stir, add 40 ml of potassium hydroxide solution (500 g/l), dilute to 100 ml. Mix well, allow to settle, decant the clear supernatant liquid and store in the dark.
- b) Dissolve 3,5 g of potassium iodide and 1,25 g of mercury(II) chloride in 80 ml of water. Add cold saturated mercury(II) chloride solution, while shaking, until a slight red precipitate remains, then add 12 g of sodium hydroxide, shake until dissolved. Finally add a little more of the saturated mercury(II) chloride solution and dilute to 100 ml with water. Shake occasionally over a period of several days, allow to stand and use the clear supernatant liquid for the test.

## 5 Apparatus

Normal laboratory equipment, plus the following:

- 5.1 **Sintered-silica filter crucible**, porosity grade P10 or P16 (pores size index 4  $\mu\text{m}$  to 16  $\mu\text{m}$ ).
- 5.2 **Nessler cylinder**, capacity 50 ml.
- 5.3 **Distillation apparatus**.

## 6 Sampling

Take a representative sample of the product to be tested, as described in ISO 15528.

## 7 Determination of sulphates

### 7.1 Procedure

ISO 787-13:2019

<https://standards.iteh.ai/catalog/standards/iso/d3ffd1ad-4a5a-44bc-bf90-11ddf6f77ef1/iso-787-13-2019>

Take 50 ml of the clear aqueous extract obtained in one of the methods, as appropriate, for the determination of matter soluble in water (either the hot extraction method<sup>[1]</sup> or the cold extraction method<sup>[2]</sup>), acidify with 3 ml of hydrochloric acid (4.1) and boil the solution vigorously, taking care to avoid loss of solution by splashing. Add barium chloride solution (4.5), drop by drop, to the hot solution until in slight excess, and allow the solution to stand overnight. Decant the supernatant liquid through the tared silica filter crucible, transfer the precipitate to the crucible and wash it free from chloride, ignite it gently, then at red heat, cool it in a desiccator and weigh to the nearest 1 mg.

### 7.2 Expression of results

Calculate the water-soluble sulphate content  $c(\text{SO}_4)$ , as a percentage mass fraction, by [Formula \(1\)](#):

$$c(\text{SO}_4) = \frac{206 m_1}{m_0} \quad (1)$$

where

$m_0$  is the mass, in grams, of pigment used in the determination of matter soluble in water;

$m_1$  is the mass, in grams, of barium sulphate precipitate.

Report the result to two decimal places.