International Standard 787/4

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General methods of test for pigments and extenders — Part 4 : Determination of acidity or alkalinity of the aqueous extract

Méthodes générales d'essai des pigments et matières de charge — Partie 4 : Détermination de l'acidité ou de l'alcalinité de l'extrait aqueux

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

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 787/4 was developed by Technical Committee ISO/TC 35, *Paints and varnishes*, and was circulated to the member bodies in December 1979.

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

Australia	India	Poland
Austria	Ireland	Romania
Brazil	Israel	South Africa, Rep. of
Canada	Italy	Spain
China	Kenya	Sweden
Egypt, Arab Rep. of	Korea, Rep. of	Switzerland
France	Netherlands	United Kingdom
Germany, F. R.	Norway	USSR

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendation R 787/4-1968, of which it constitutes a technical revision.

Printed in Switzerland

The purpose of this International Standard is to establish a series of general test methods for pigments and extenders which are suitable for all or many of the individual pigments and extenders for which specifications might be required. In such cases, a cross-reference to the general method should be included in the International Standard relating to that pigment or extender, with a note of any detailed modifications which might be needed in view of the special properties of the product in question.

Technical Committee ISO/TC 35, *Paints and varnishes*, decided that all the general methods should be published as they become available, as parts of a single International Standard, in order to emphasize the relationship of each to the whole series.

The Technical Committee also decided that, where two or more procedures were widely used for determining the same or a similar characteristic of a pigment or extender, there would be no objection to including more than one of them in the ISO series. In such cases it will, however, be essential to state clearly in a specification which method is to be used and, in the test report, which method has been used.

Parts of the series already published are as follows :

Part 1 : Comparison of colour of pigments
Part 2 : Determination of matter volatile at 105 °C
Part 3 : Determination of matter soluble in water — Hot extraction method
Part 4 : Determination of acidity or alkalinity of the aqueous extract
Part 5 : Determination of oil absorption value
Part 6 : Determination of residue on sieve — Oil method
Part 7 : Determination of residue on sieve — Water method — Manual procedure
Part 8 : Determination of matter soluble in water — Cold extraction method
Part 9 : Determination of pH value of an aqueous suspension
Part 10 : Determination of density — Pyknometer method
Part 11 : Determination of tamped volume and apparent density after tamping
Part 13 : Determination of water-soluble sulphates, chlorides and nitrates
Part 14 : Determination of resistivity of aqueous extract
Part 15 : Comparison of resistance of coloured pigments of similar types to light from a specified light source
Part 16 : Comparison of relative tinting strength (or equivalent colouring value) and colour on reduction in linseed stand oil using the automatic muller
Part 17 : Comparison of lightening power of white pigments
Part 18 : Determination of residue on sieve — Water method — Mechanical flushing procedure
Part 19 : Determination of water-soluble nitrates — Salicylic acid method
Part 20 : Comparison of ease of dispersion — Oscillatory shaking method
Part 21 : Comparison of heat stability of pigments using a stoving medium
Part 22 : Comparison of resistance to bleeding of pigments
Part 23 : Determination of density (using a centrifuge to remove entrained air)
Part 24 : Determination of relative tinting strength of coloured pigments and relative scattering power of white pigments — Photometric method

General methods of test for pigments and extenders — Part 4 : Determination of acidity or alkalinity of the aqueous extract

0 Introduction

This document is a part of ISO 787, *General methods of test for pigments and extenders.*

1 Scope and field of application

This part of ISO 787 specifies a general method of test for determining the acidity or alkalinity of the aqueous extract of a sample of pigment or extender.

NOTE — When this general method is applicable to a given pigment or extender, only a cross-reference to it should be included in the International Standard relating to that pigment or extender, with a note of any detailed modification which may be needed in view of the special properties of the material in question. Only when this general method is not applicable to a particular material should a special method for determination of acidity or alkalinity be specified.

2 References

ISO/R 385, *Burettes.*

ISO 787, *General methods of test for pigments and extenders*

— *Part 3 : Determination of matter soluble in water — Hot extraction method.*

— *Part 8 : Determination of matter soluble in water — Cold extraction method.*

ISO 842, *Raw materials for paints and varnishes — Sampling.*

3 Reagents

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

3.1 Hydrochloric acid, standard volumetric solution, c(HCl) = 0,05 mol/l.

3.2 Sodium hydroxide, standard volumetric solution, c(NaOH) = 0,05 mol/l, or **potassium hydroxide,** standard volumetric solution, c(KOH) = 0,05 mol/l.

For method A :

3.3 Methyl red indicator, 1 g/l solution in 60 % (V/V) ethanol.

4 Apparatus

Ordinary laboratory apparatus and

4.1 Burette, of capacity 50 ml, complying with the requirements of ISO/R 385.

For method B :

4.2 pH measuring device, capable of measurement to 0,1 unit, calibrated against buffer solutions of known pH value at the temperature of the test.

5 Sampling

Take a representative sample of the material to be tested as described in ISO 842.

6 Procedure

Carry out the determination in duplicate.

6.1 Test solution

Follow the procedure specified in ISO 787/3, to the stage of obtaining a perfectly clear filtrate.

NOTE — If agreed or specified, the procedure described in ISO 787/8 (cold extraction method) may be followed. In this case, the period of stirring should be reduced to 5 min.

6.2 Determination

NOTE — If the filtrate is coloured the use of the indicator (6.2.1) is not suitable. The potentiometric method (6.2.2) should be used.

6.2.1 With indicator solution (method A)

Add 5 drops of the methyl red indicator (3.3) to 100 ml of the test solution (6.1).

If the solution is orange, consider it as being neutral.

If the solution is yellow (alkaline), titrate it with the hydrochloric acid solution (3.1) to an orange end-point.

If the solution is red (acid), titrate it with the sodium or potassium hydroxide solution (3.2) to an orange end-point.

NOTE — By agreement between the parties, another colour indicator can be used.

6.2.2 Potentiometric determination (method B)

Take 100 ml of the test solution (6.1), insert the electrodes of the pH measuring device and read the pH value.

If the pH value is between 4 and 8, consider the solution as being neutral.

If the pH value is more than 8 (alkaline), titrate the solution with the hydrochloric acid solution (3.1) to a pH value just less than 8.

If the pH value is less than 4 (acid), titrate the solution with the sodium or potassium hydroxide solution (3.2) to a pH value just more than 4.

6.2.3 Repeat determinations

If the results of the duplicate determinations differ by more than 5 % of the higher value, the procedure (clause 6) should be repeated.

7 Expression of results

7.1 Calculation

Calculate the acidity (alkalinity) by the equation

$$A = \frac{V \times 2{,}5 \times 100}{2 \times m}$$

$$= 125 \frac{V}{m}$$

where

A is the acidity (alkalinity) expressed as millilitres of 0,1 mol/l alkali (hydrochloric acid) solution required to neutralise the extract of 100 g of product;

m is the mass, in grams, of the sample taken to prepare the test solution (6.1);

V is the volume, in millilitres, of the sodium or potassium hydroxide solution (3.2) or hydrochloric acid solution (3.1).

If the extract is neutral, report the result as "neutral".

For titrimetric measurements report the mean of the two determinations.

7.2 Precision

No precision data are currently available.

8 Test report

The test report shall contain at least the following information :

a) the type and identification of the product tested;

b) a reference to this International Standard (ISO 787/4);

c) the result of the test as indicated in clause 7;

d) any deviation, by agreement or otherwise, from the procedure specified;

e) the date of the test.