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**INTERNATIONAL STANDARD**



**1389 / VI**

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**Phthalic anhydride for industrial use — Methods of test —  
Part VI : Determination of phthalic anhydride content —  
Titrimetric method**

*Anhydride phtalique à usage industriel — Méthodes d'essai —  
Partie VI : Détermination de la teneur en anhydride phtalique — Méthode titrimétrique*

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**Descriptors :** phthalic anhydride, tests, chemical analysis, determination, colouring, solidification point, acidity, phthalic anhydride, maleic anhydride, ash, impurities, iron, naphthoquinones.

## 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.

Prior to 1972, the results of the work of the technical committees were published as ISO Recommendations; these documents are in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 47, *Chemistry*, has reviewed ISO Recommendation R 1389-1970 and found it technically suitable for transformation. The technical committee, however, divided the recommendation into eleven parts (ISO 1389, parts I to XI), which therefore replace ISO Recommendation R 1389-1970, to which they are technically identical.

ISO Recommendation R 1389 had been approved by the member bodies of the following countries :

Austria	India	South Africa, Rep. of
Belgium	Iran	Spain
Brazil	Ireland	Sweden
Cuba	Italy	Switzerland
Czechoslovakia	Korea, Rep. of	Thailand
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Portugal	
Hungary	Romania	

No member body had expressed disapproval of the Recommendation.

The member bodies of the following countries disapproved the transformation of the Recommendation into an International Standard :

France  
Netherlands

# Phthalic anhydride for industrial use – Methods of test – Part VI : Determination of phthalic anhydride content – Titrimetric method

## 1 SCOPE AND FIELD OF APPLICATION

This part of ISO 1389 specifies a titrimetric method for the determination of the phthalic anhydride content of phthalic anhydride for industrial use.

This document should be read in conjunction with part I (see the annex).

## 2 PRINCIPLE

Dissolution of a test portion in an excess of standard volumetric sodium hydroxide solution and back-titration of the excess with a standard volumetric hydrochloric acid solution, using phenolphthalein as indicator.

## 3 REAGENTS

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

**3.1 Sodium hydroxide**, 1 N standard volumetric solution.

**3.2 Hydrochloric acid**, 1 N standard volumetric solution.

**3.3 Phenolphthalein**, 5 g/l ethanolic solution.

Dissolve 0,5 g of phenolphthalein in 100 ml of 95 % (V/V) ethanol and make slightly pink by addition of dilute sodium hydroxide solution.

## 4 APPARATUS

Ordinary laboratory apparatus and

**4.1 Conical flask**, of borosilicate glass, of capacity 250 ml.

## 5 PROCEDURE

**5.1** Place 2 g, weighed to the nearest 0,005 g, of the test sample in the conical flask (4.1), add 50 ml of the sodium hydroxide solution (3.1), and heat on a boiling water bath until the test portion is dissolved. Allow the solution to cool.

**5.2** Add 0,5 ml of the phenolphthalein solution (3.3) and titrate immediately with the hydrochloric acid solution (3.2) until the pink colour has just disappeared.

## 6 EXPRESSION OF RESULTS

The phthalic anhydride [ $C_6H_4(CO)_2O$ ] content, expressed as a percentage by mass, is given by the formula

$$\frac{(50 - V) \times 7,406}{m} - 0,89 A - 1,51 B$$

where

$V$  is the volume, in millilitres, of the hydrochloric acid solution (3.2) used;

$m$  is the mass, in grams, of the test portion (see 5.1);

$A$  is the free acidity, expressed as a percentage by mass of phthalic acid (see part V);

$B$  is the maleic anhydride content, expressed as a percentage by mass (see part VII).

NOTE – If the concentration of the standard volumetric solutions used is not exactly as specified in the list of reagents, appropriate corrections should be made.