International Standard 1388/2

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Ethanol for industrial use — Methods of test — Part 2 : Detection of alkalinity or determination of acidity to phenolphthalein

Éthanol à usage industriel — Méthodes d'essai — Partie 2 : Détection de l'alcalinité ou détermination de l'acidité à la phénolphtaléine

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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 1388/2 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in February 1980.

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

Australia	Germany, F.R.	Romania
Austria	Hungary	South Africa, Rep. of
Belgium	India	Switzerland
Brazil	Italy	Thailand
Bulgaria	Korea, Rep. of	United Kingdom
China	Netherlands	USSR
Czechoslovakia	Philippines	
France	Poland	

No member body expressed disapproval of the document.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

International Standards ISO 1388/1 to ISO 1388/12 cancel and replace ISO Recommendation R 1388-1970, of which they constitute a technical revision.

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Ethanol for industrial use — Methods of test — Part 2 : Detection of alkalinity or determination of acidity to phenolphthalein

1 Scope and field of application

This part of ISO 1388 specifies a method for the detection of alkalinity and, if appropriate, the subsequent determination of acidity of ethanol for industrial use.

The method is applicable to products having acidities, expressed as acetic acid (CH_3COOH), greater than or equal to 0,000 8 % (*m/m*).

This document should be read in conjunction with ISO 1388/1 (see the annex).

2 Principle

Dilution of a test portion with carbon dioxide-free water.

Checking whether the test solution is alkaline or acid to phenolphthalein, and, if appropriate, determination of the acidity by titration with standard volumetric sodium hydroxide solution.

3 Reagents

During the analysis, use only reagents of recognized analytical grade and distilled water or water of equivalent purity, carbon dioxide-free, recently prepared.

3.1 Water, carbon dioxide-free.

Boil distilled water and allow it to cool in a flask fitted with a stopper carrying a soda-lime guard-tube.

3.2 Sodium hydroxide, standard volumetric solution, *c*(NaOH) = 0,1 mol/l.

3.3 Phenolphthalein, 5 g/l ethanolic solution.

Dissolve 0,5 g of phenolphthalein in 100 ml of 95 % (*V/V*) ethanol and add the sodium hydroxide solution (3.2) until a pale pink coloration is obtained.

4 Apparatus

Ordinary laboratory apparatus, and

4.1 Conical flask, of borosilicate glass, of capacity 500 ml, fitted with a ground glass stopper carrying a soda-lime guard-tube.

4.2 Burette, of capacity 10 ml, graduated in 0,02 ml.

5 Procedure

5.1 Test portion

Take 100 ± 0,1 ml of the laboratory sample.

5.2 Determination

Place 100 ml of the water (3.1) in the conical flask (4.1), add 0,5 ml of the phenolphthalein solution (3.3) and, if necessary, restore the pale pink coloration by the addition of a few drops of the sodium hydroxide solution (3.2). Add the test portion (5.1) and a further 0,5 ml of the phenolphthalein solution (3.3) and note whether the solution is alkaline; if acid, titrate the test solution with the sodium hydroxide solution (3.2), stoppering the flask and swirling its contents after each addition, until a pink coloration, persisting for about 15 s, is obtained. Shake the contents of the flask, with the stopper in position, after each addition of sodium hydroxide solution.

6 Expression of results

6.1 Alkaline products

Indicate whether the product is alkaline to phenolphthalein.

6.2 Acidic products

The acidity, expressed as a percentage by mass of acetic acid (CH_3COOH) , is given by the formula

$$\frac{0{,}006 \times V}{\varrho}$$

where

V is the volume, in millilitres, of the sodium hydroxide solution (3.2) used for the determination;

ϱ is the density, in grams per millilitre, of the sample at 20 °C (see ISO 1388/1, clause 4);

0,006 is the mass, in grams, of acetic acid corresponding to 1 ml of sodium hydroxide solution, *c*(NaOH) = 0,100 mol/l.

NOTE — If the standard volumetric solution used is not of the exact concentration specified in the list of reagents, an appropriate correction should be applied.

Annex

ISO Publications relating to ethanol for industrial use

ISO 1388/1 — General.

ISO 1388/2 — Detection of alkalinity or determination of acidity to phenolphthalein.

ISO 1388/3 — Estimation of content of carbonyl compounds present in small amounts — Photometric method.

ISO 1388/4 — Estimation of content of carbonyl compounds present in moderate amounts — Titrimetric method.

ISO 1388/5 — Determination of aldehydes content — Visual colorimetric method.

ISO 1388/6 — Test for miscibility with water.

ISO 1388/7 — Determination of methanol content [methanol contents between 0,01 and 0,20 % (*V*/*V*)] — Photometric method.

ISO 1388/8 — Determination of methanol content [methanol contents between 0,10 and 1,50 % (*V*/*V*)] — Visual colorimetric method.

ISO 1388/9 — Determination of esters content — Titrimetric method after saponification.

ISO 1388/10 — Estimation of hydrocarbons content — Distillation method.

ISO 1388/11 — Test for detection of furfural.

ISO 1388/12 — Determination of permanganate time.