
INTERNATIONAL STANDARD



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**Formaldehyde solutions for industrial use —
Determination of methanol content**

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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 2228 was drawn up by Technical Committee ISO/TC 47, *Chemistry*.

It was approved in July 1971 by the Member Bodies of the following countries :

Austria	Ireland	South Africa, Rep. of
Czechoslovakia	Israel	Sweden
Egypt, Arab Rep. of	Italy	Switzerland
France	Netherlands	Turkey
Germany	New Zealand	United Kingdom
Hungary	Romania	U.S.S.R.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Belgium
U.S.A.

Formaldehyde solutions for industrial use — Determination of methanol content

WARNING

Formaldehyde is toxic. It is therefore necessary to avoid inhaling its vapour during sampling and testing.

1 SCOPE

This International Standard specifies a method for the determination of the methanol content of formaldehyde solutions for industrial use.

NOTE — The result obtained by this method will include the methanol freed from combined forms by the procedure, e.g. by saponification of any methyl formate present. These combined forms are however not usually present at sufficiently high levels to affect the result of the determination.

2 FIELD OF APPLICATION

This method is intended for methanol contents greater than 0,2 % and significant errors may occur if the methanol content is less than this value.

3 PRINCIPLE

Esterification of the methanol present with formic acid using sulphuric acid as a catalyst. Distillation of the methyl formate into sodium hydroxide solution, and back-titration of the excess sodium hydroxide with a standard volumetric sulphuric acid solution, using phenolphthalein as indicator.

4 REAGENTS

Distilled water, or water of equivalent purity, freshly boiled and cooled and neutral to phenolphthalein, shall be used in the test.

4.1 Formic acid, 80 % (*m/m*) solution.

4.2 Sulphuric acid, ρ 1,84 g/ml, approximately 96 % (*m/m*) solution, diluted 1 + 3 by volume.

4.3 Acetone, pure, neutral.

4.4 Sodium hydroxide, approximately N solution.

4.5 Sulphuric acid, N standard volumetric solution.

4.6 Phenolphthalein, 5 g/l ethanolic solution.

Dissolve 0,5 g of phenolphthalein in 100 ml of 95 % (V/V) ethanol and add approximately 0,1 N sodium hydroxide solution until faintly pink.

5 APPARATUS

Ordinary laboratory apparatus and the following apparatus (see Figure), constructed of borosilicate glass and having ground glass joints, comprising :

5.1 Flask, capacity 100 ml.

5.2 Vigreux type column, of effective length 400 mm and inside diameter 20 mm. The top 300 mm of this column is covered by a sleeve, of 30 mm inside diameter, the upper end of which is open to the atmosphere and the lower end of which is fused to the column. This column is fitted with an upper lateral tube, connected to a **condenser**.

5.3 Thermometer, covering the range 0 to 100 °C and graduated in 0,5 °C divisions.

5.4 Special adaptor enabling the distilled ester to be collected without loss to the atmosphere.

5.5 Conical flask, capacity 200 ml.

6 SAMPLING

Follow the principles given in ISO ...¹⁾.

Attention is drawn to the following recommendation. Place the laboratory sample, representative of the material taken from the bulk, in a clean, dry, and air-tight glass stoppered bottle of such a size that it is nearly filled by the sample.

If it is necessary to seal this bottle care shall be taken to avoid the risk of contamination.

1) Sampling from the consignment of the product will form the subject of a future International Standard.