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# INTERNATIONAL STANDARD 1904

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# Liquefied phenol for industrial use — Determination of phenols content — Bromination method

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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 1904 was drawn up by Technical Committee ISO/TC 47, *Chemistry.*

It was approved in April 1970 by the Member Bodies of the following countries:

| | | |
|---|---|---|
| Australia | Hungary | Portugal |
| Belgium | India | Romania |
| Chile | Israel | South Africa, Rep. of |
| Czechoslovakia | Italy | Spain |
| Egypt, Arab Rep. of | Japan | Switzerland |
| France | Netherlands | Thailand |
| Germany | New Zealand | Turkey |
| Greece | Poland | U.S.S.R. |

The Member Body of the following country expressed disapproval of the document on technical grounds:

United Kingdom



Printed in Switzerland

# Liquefied phenol for industrial use — Determination of phenols content — Bromination method

WARNING. Phenols burn the skin and can be absorbed into the system through the skin. It is essential for the sampler to wear protective gloves, for example of polyvinyl chloride, and also a face shield. Inhalation of the vapours from hot material is to be avoided.

Phenols are extremely hygroscopic, and care should be taken to avoid contamination with atmospheric or other moisture.

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard describes a method for the determination of the phenols content of "liquefied phenol" by bromination. The method is not specific for phenol but determines the total amount of material that can be brominated under the conditions of the test.

The method as described is applicable to mixtures of about 80 % phenol for industrial use and 20 % water (V/V) (commonly called "liquefied phenol"). It can be applied to any mixture of phenol in water, provided that suitable adjustments are made.

## 2 SAMPLING

Apply the principles given in ISO ...[1]. The following principles shall also be observed :

Place the laboratory sample representative of the material taken from the bulk in a clean, dry, dark-coloured, glass-stoppered bottle of such a size that it is nearly filled by the sample. If it is necessary to seal this bottle, care should be taken to avoid contaminating the contents.

## 3 PRINCIPLE

Reaction between phenol and bromine from a measured amount of standard bromide/bromate solution with the formation of tribromophenol, followed by iodometric determination and allowance for excess bromine using a standard volumetric solution of sodium thiosulphate.

## 4 REAGENTS

Distilled water or water of equivalent purity shall be used in the test.

**4.1 Chloroform,** $\rho$ 1.49 g/ml approximately.

**4.2 Hydrochloric acid,** $\rho$ 1.19 g/ml approximately 38 % (m/m) solution.

**4.3 Potassium iodide,** 150 g/l solution.

**4.4 Potassium bromide/bromate,** 0.1 N standard volumetric solution. Dissolve 10 g of potassium bromide and 2.784 g of potassium bromate in water, then transfer quantitatively to a 1 000 ml one-mark volumetric flask, dilute to the mark, and mix.

**4.5 Sodium thiosulphate,** 0.1 N standard volumetric solution.

**4.6** Indicator. Use either:

**4.6.1 Starch,** 5 g/l solution, freshly prepared, or

**4.6.2 Sodium starch glycollate,** 5 g/l solution.

## 5 APPARATUS

Ordinary laboratory apparatus and

**5.1 Iodine flask,** 500 ml, as shown in the Figure.

Dimensions in millimetres

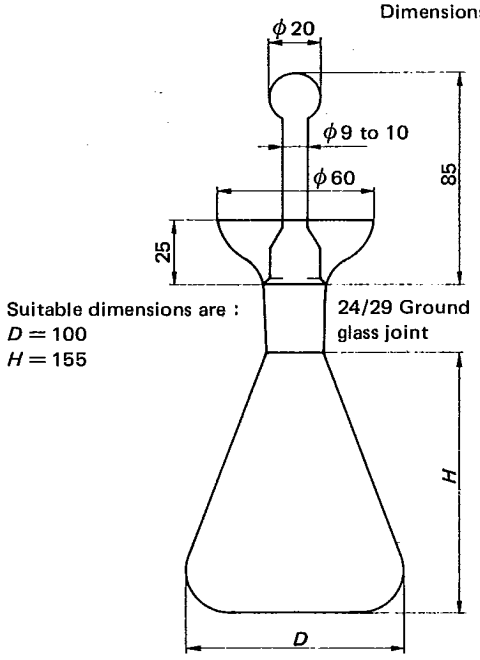


FIGURE — **500 ml iodine flask (5.1)**

1) Sampling of chemical products will form the subject of a future International Standard.

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 1919 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

This fourth edition cancels and replaces the third edition (ISO 1919 : 1982), of which it constitutes a minor revision and alignment to other TC 22 International Standards on spark-plugs.



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ANNEX

This document forms one of a series on methods of test for phenol, cresols, cresylic acid and xylenols for industrial use.

The complete list of those documents already prepared or in course of preparation is as follows:

**PHENOL, *o*-CRESOL, *m*-CRESOL, *p*-CRESOL, CRESYLIC ACID, XYLENOLS**

ISO/R 1897, *Determination of water by the Karl Fischer method.*
ISO/R 1898, *Determination of water by the Dean and Stark method.*
ISO/R 1899, *Determination of neutral oils and pyridine bases.*

**PHENOL, *o*-CRESOL, *m*-CRESOL, *p*-CRESOL**

ISO/R 1900, *Determination of residue on evaporation.*
ISO/R 1901, *Determination of crystallizing point.*
ISO 2208, *Determination of crystallizing point after drying with a molecular sieve.*[1)]
ISO/R 1902, *Test for impurities insoluble in sodium hydroxide solution — Visual test.*
ISO 2273, *Determination, after combustion, of total sulphur (conductimetric method) and chlorine content (potentiometric or spectrophotometric method).*[1)]

**LIQUEFIED PHENOL, *m*-CRESOL, CRESYLIC ACID, XYLENOLS**

ISO/R 1903, *Determination of density at 20° C.*

**LIQUEFIED PHENOL**

ISO 1904, *Determination of phenols content — Bromination method.*

**PHENOL**

ISO/R 1905, *Test for impurities insoluble in water — Visual test.*

**CRESYLIC ACID AND XYLENOLS**

ISO/R 1906, *Determination of distillation range.*
ISO/R 1907, *Determination of residue on distillation.*
ISO/R 1908, *Test for absence of hydrogen sulphide.*
ISO/R 1909, *Measurement of colour.*
ISO/R 1910, *Determination of o-cresol content.*

**CRESYLIC ACID**

ISO/R 1911, *Determination of m-cresol content.*

NOTE — A laboratory sample of not less than 500 ml (for phenol and cresols) or 1 000 ml (for cresylic acid and xylenols) is necessary to carry out the whole series of tests described in these documents.

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1) At present at the stage of Draft.