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Chlorofluorinated hydrocarbons — Determination of boiling range — Test for product characterization

MODIFICATION TO FOREWORD *(Inside front cover)*

The following sentence is to be added at the end of the foreword : This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

International Standard 5917

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Chlorofluorinated hydrocarbons — Determination of boiling range — Test for product characterization

Hydrocarbures chlorofluorés — Détermination de l'intervalle de distillation — Essai de caractérisation du produit

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ISO 5917-1980 (E)

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 5917 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in April 1979.

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

Australia	France	Netherlands
Austria	Germany, F. R.	Romania
Belgium	Hungary	South Africa, Rep. of
Chile	India	Switzerland
China	Israel	United Kingdom
Czechoslovakia	Italy	USSR
Egypt, Arab Rep. of	Mexico	

No member body expressed disapproval of the document.

Printed in Switzerland

Chlorofluorinated hydrocarbons — Determination of boiling range — Test for product characterization

1 Scope and field of application

This International Standard specifies a method for the determination of the boiling range of chlorofluorinated hydrocarbons.

The method permits measurement of temperature differences of 0,5 °C. It should not be considered as an analytical method but as a test for identification and indication of the purity of a product.

2 References

ISO 653, *Long solid-stem thermometers for precision use.*

ISO 654, *Short solid-stem thermometers for precision use.*

ISO 2209, *Liquid halogenated hydrocarbons for industrial use — Sampling.*

ISO 3427, *Gaseous halogenated hydrocarbons (liquefied gases) — Taking of a sample.*

3 Principle

Evaporation by boiling of a known volume of the product under test and measurement of the temperatures corresponding to the evaporation of 5 and 95 % of the initial volume of the liquid.

4 Definition

For the purposes of this International Standard, the following definition applies :

boiling range : The difference between the temperature at which 5 % of the initial volume of a sample of the product has evaporated and that at which 95 % has evaporated.

5 Apparatus

5.1 Flask, of capacity 100 ml, as illustrated in the figure, graduated at 2, 3, 5, 95 and 100 ml and fitted with a vacuum jacket.

NOTE — The additional graduations at 2 and 3 ml permit the same flask to be used for determining other boiling ranges.

5.2 Precision thermometer, graduated at every 0,1 °C, complying with the requirements of ISO 653 or 654, having a range appropriate to the expected boiling range of the product being tested.

5.3 Water bath, capable of being controlled at a temperature approximately 10 °C above the expected boiling range of the product being tested.

5.4 Refrigerated bath, capable of being controlled at a temperature approximately 10 °C below and 5 °C above the expected boiling range of the product being tested, for cooling the sample container and warming the flask (5.1) used for the determination.

6 Sampling

Laboratory samples of liquid products shall be collected by the method specified in ISO 2209.

Laboratory samples of products which are gaseous at ordinary temperatures shall be collected as a liquefied gas in a stainless steel sample cylinder (type a) by the method specified in ISO 3427.

7 Procedure

WARNING — Prepare the test portion and carry out the determination in a well ventilated fume cupboard.

7.1 Test portion

Dip the bottle containing the laboratory sample [see ISO 3427, cylinder type a)] into the refrigerated bath (5.4) controlled at the appropriate temperature for 5 min.

Connect the dip-tube valve of the cylinder to a connector capable of delivering the liquid sample into the flask (5.1).

Open the valve and fill the flask exactly to the 100 ml graduation mark. Close the valve and remove the connector.

7.2 Determination

Add a small piece of carborundum to the flask to regulate boiling.

Immerse the lower part of the vacuum jacket of the flask vertically in the water bath (5.3) or the refrigerated bath (5.4), controlled at the appropriate temperature. Wrap a small piece of cotton gauze around the bulb of the thermometer (5.2), so that a wick 10 to 15 mm long is suspended. Insert the thermometer into the flask so that its bulb just touches the surface of the liquid.

During the determination of the boiling range, lower the thermometer continuously so that the wick is always immersed.

Record, to the nearest 0,05 °C, the temperatures indicated by the thermometer when 5 ml and 95 ml of the test portion have evaporated.

8 Expression of results

The boiling range $\Delta E_{(5-95)}$, in degrees Celsius, is given by the formula

$$\Delta E_{(5-95)} = t_2 - t_1$$

where

t_1 is the boiling point, in degrees Celsius, after 5 ml of the initial volume has evaporated;

t_2 is the boiling point, in degrees Celsius, after 95 ml of the initial volume has evaporated.

9 Test report

The test report shall include the following particulars :

a) information concerning the sample (nature, origin, supplier, etc.);

b) the reference of the method used;

c) information relative to the identification and purity of the sample, including the measured values of t_1 and t_2;

d) any unusual features noted during the determination;

e) any operation not included in this International Standard or in the International Standards to which reference is made, or regarded as optional.

Dimensions in millimetres

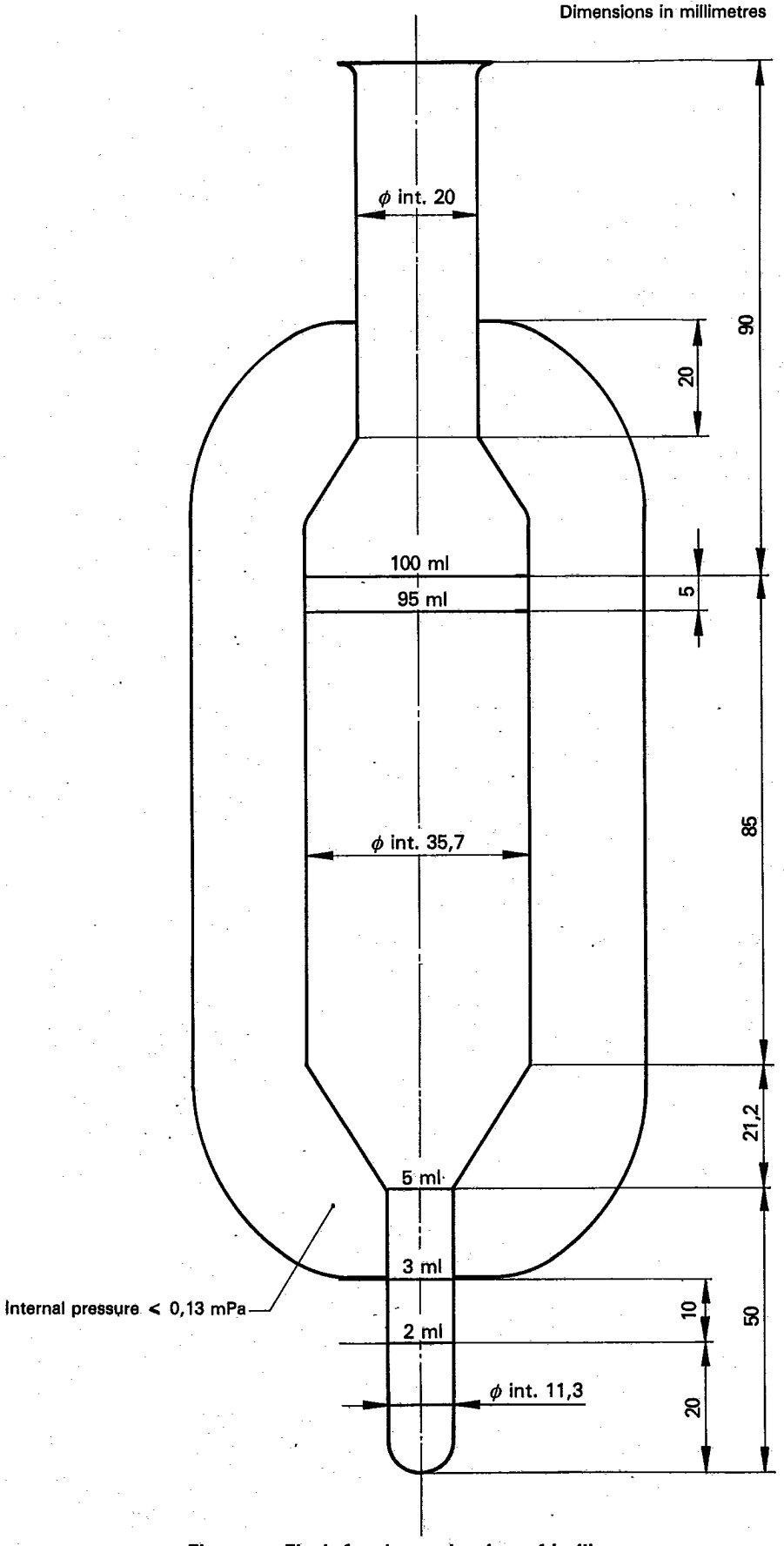

Figure — Flask for determination of boiling range