
INTERNATIONAL STANDARD



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Liquid chlorine for industrial use — Determination of water content — Gravimetric method

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FOREWORD

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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.

International Standard ISO 2121 was drawn up by Technical Committee ISO/TC 47, *Chemistry*.

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

Austria	India	South Africa, Rep. of
Belgium	Ireland	Spain
Chile	Israel	Switzerland
Czechoslovakia	Italy	Thailand
Egypt, Arab Rep. of	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Poland	U.S.S.R.
Hungary	Portugal	

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

U.S.A.

Liquid chlorine for industrial use – Determination of water content – Gravimetric method

1 SCOPE

This International Standard specifies a gravimetric method for the determination of the “volatile water”, i.e. that which volatilizes at the same time as the chlorine, originating from the gasification of liquid chlorine for industrial use.

2 FIELD OF APPLICATION

This method is applicable to products the water content of which is greater than 5 ppm (0.000 5 % m/m).

NOTE — This method should not be applied to the analysis of samples stored in bottles subject to corrosion. The determination of water would then be falsified by the presence of ferric chloride, which is hygroscopic.

3 PRINCIPLE

Absorption of the water by passing the gasified sample into tared absorbers containing phosphorus pentoxide or magnesium perchlorate.

Elimination of the gaseous chlorine and volatile impurities, other than water, also present, by flushing the absorbers with air or dry nitrogen heated to 80 °C.

Absorption of the chlorine leaving the absorbers in a tared bottle containing sodium hydroxide solution..

Weighing of the absorbers and the flask containing the sodium hydroxide solution to determine respectively, by difference from the original masses, the mass of water found and that of the sample taken initially.

4 REAGENTS

4.1 Absorbent

Choose one of the following two reagents :

4.1.1 *Phosphorus pentoxide*, or

4.1.2 *Magnesium perchlorate*, in the form of tablets or granules of 3 to 5 mm, in order to avoid loss of mass of material during the absorption of water. This reagent should not contain more than 2 molecules of water of hydration (i.e. 13.9 %), this being confirmed by the method given in the Annex.

Do not use this reagent if the chlorine to be analysed contains organic matter.

4.2 Air or nitrogen, dry.

It is convenient to dry these gases by passing them through a tower containing the absorbent (4.1.1) or (4.1.2).

4.3 Sodium hydroxide, 200 g/l solution or approximately 5 N.

4.4 Iodized starch, solution containing 5 g/l of starch and 150 g/l of potassium iodide.

4.5 Acetone.

4.6 Chlorine-resistant grease. Greases based on fluorinated or chlorofluorinated products are suitable.

5 APPARATUS

The apparatus used is shown diagrammatically in Figure 2. It comprises the following components :

- **Bottle (A)** containing 2 l of the sodium hydroxide solution (4.3) for absorbing the sample of chlorine used.
- **Bubbler (C)** containing iodized starch solution (4.4), for regulating the rate of chlorine absorption.
- **Capillary flowmeter (D)** and differential manometer (M) containing carbon tetrachloride to permit a delivery of 25 l/h of gaseous chlorine. A suitable floating indicator flowmeter can be used instead.
- **U-tube (E)** fitted with ground glass joints, filled with mineral wool previously dried in an oven at 110 °C for 1 h.
- **Filter (F)**, consisting of a threaded steel tube having an inside diameter of approximately 6 mm, 150 mm long and filled with glass wool.
- **Safety bottle (G).**
- **Electric heater (H).**
- **Glass valve (P)** filled with carbon tetrachloride.