
INTERNATIONAL STANDARD



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Liquid chlorine for industrial use — Determination of the content of chlorine by volume in the vaporized product

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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 2120 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	Israel	Spain
Chile	Italy	Switzerland
Czechoslovakia	Netherlands	Thailand
France	New Zealand	Turkey
Germany	Poland	U.S.A.
Hungary	Portugal	U.S.S.R.

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

United Kingdom

Liquid chlorine for industrial use – Determination of the content of chlorine by volume in the vaporized product

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the chlorine content by volume in liquid chlorine for industrial use, after vaporization of the product.

2 PRINCIPLE

Sampling of a known volume of chlorine (about 100 ml) obtained by gasification of liquid chlorine.

Absorption of the chlorine by a 2 % zinc amalgam in the presence of 1 ml of saturated sodium chloride solution.

Measurement of the residual, non-condensable gases such as H_2 , O_2 , N_2 , CO , CO_2 , etc.

Calculation of the volume of chlorine (difference from total volume), referred to 100 ml of vaporized sample.

3 REAGENTS

3.1 Zinc amalgam

WARNING: MERCURY AND ZINC AMALGAM SHOULD BE HANDLED TAKING ALL THE PRECAUTIONS MADE NECESSARY BY THE TOXICITY OF THESE PRODUCTS. IN PARTICULAR OPERATE IN A WELL-VENTILATED HOOD AND TAKE CARE TO AVOID ALL CONTACT WITH THE SKIN.

Place about 4 kg of pure mercury in a porcelain dish of 1 l capacity. Add about 80 g of granulated zinc and cover all with an approximately 0.01 N sulphuric acid solution.

Heat to 80 °C; keep the mixture at this temperature, stirring from time to time with a glass stirrer, until the zinc is completely amalgamated, and allow to cool.

Keep the amalgam under 0.01 N sulphuric acid, in order to avoid its oxidation by the air.

3.2 Sodium chloride solution, saturated at ambient temperature.

3.3 Sodium hydroxide, ρ 1.22 g/ml approximately, 20 % (m/m) solution, approximately.

3.4 Sulphuric acid, approximately 2 N solution.

3.5 Methanol, technical.

3.6 Chlorine-resistant grease

Greases based on fluorinated or chlorofluorinated products are suitable.

4 APPARATUS

The apparatus used is shown diagrammatically in the Figure.

It comprises the following components:

- **Gas burette (A)**, of known volume (approximately 100 ml), the upper part under the stopcock consisting of 7 mm diameter tube of approximately 2 ml capacity graduated downwards in 0.05 ml.
- **Steel needle valve (C)**
- **Flask with side nozzle (D)**, capacity 250 ml and containing 150 ml of zinc amalgam (3.1).
- **Upper reservoir (E)** of the gas burette.
- **Levelling bottle (F)**, capacity 250 ml and containing 150 ml of zinc amalgam (3.1).
- **Bubbler (G)**, containing water allowing the gas flow to be controlled and having dipping tubes with an internal diameter of 5 mm.
- **Safety bottle (H)**.
- **Receiver (K)**, capacity 2 l and containing 1 l of sodium hydroxide solution (3.3) to absorb the excess chlorine.
- **Filter (L)**, consisting of a threaded steel tube having an inside diameter of approximately 6 mm, 150 mm long and filled with glass wool.
- **Glass tube (M)**, having an inside diameter of approximately 6 mm.
- **T-bore stopcock (R)**.
- **3 V-bore stopcocks (R1, R2 and R4)**.
- **Straight bore stopcock (R3)**.
- **Tilting stand (S)** for the chlorine bottle.
- **Draining vessel (V)**.
- **Connections (a, b, c, d)**.
- **Rubber tubes (f)**.
- **Elastomer tubes (g, g1, g2)** resistant to chlorine.
- **Elastomer connectors (h)** resistant to chlorine.