International Standard 7108

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Ammonia solution for industrial use — Determination of ammonia content — Titrimetric method

Ammoniaque à usage industriel — Détermination du titre en ammoniac — Méthode titrimétrique

First edition — 1985-06-01

UDC 661.5 : 543.24 : 543.272.35 **Ref. No. ISO 7108-1985 (E)**

Descriptors : industrial products, chemical compounds, ammonia solution, chemical analysis, determination of content, ammonia (gas), volumetric analysis.

Price based on 2 pages

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

International Standard ISO 7108 was prepared by Technical Committee ISO/TC 47, *Chemistry*.

Printed in Switzerland

INTERNATIONAL STANDARD ISO 7108-1985 (E)

Ammonia solution for industrial use — Determination of ammonia content — Titrimetric method

WARNING — Carry out all the operations in a well-ventilated fume cupboard.

1 Scope and field of application

This International Standard specifies a titrimetric method for the determination of the ammonia content of ammonia solution for industrial use. The method is applicable to solutions containing not more than 35 % (*m/m*) of ammonia.

2 Principle

Introduction of a test portion into a solution of boric acid and titration with a standard volumetric solution of sulfuric acid in the presence of methyl red as indicator.

3 Reagents

During the analysis use only reagents of recognised analytical grade and only distilled water or water of equivalent purity.

3.1 Boric acid, 20 g/l solution.

3.2 Sulfuric acid, standard volumetric solution, $c(1/2\ H_2SO_4) = 1$ mol/l.[1)]

3.3 Methyl red, 1 g/l ethanolic solution.

Dissolve 0,1 g of methyl red in 95 % (*V/V*) ethanol and make up to 100 ml with the same ethanol.

4 Apparatus

Ordinary laboratory apparatus and

4.1 Spherical ampoule, of thin glass, of suitable capacity and shape, for example, about 20 mm diameter, with one capillary end about 50 mm in length (a typical example is shown in the figure).

Dimensions in millimetres

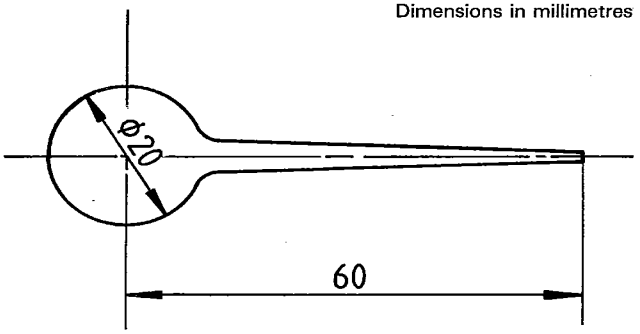

Figure — Spherical glass ampoule

5 Procedure

5.1 Test portion

Weigh the glass ampoule (4.1) to the nearest 0,000 1 g. Gently heat the spherical part of the ampoule over a flame and dip the capillary end of the ampoule into the bottle containing the laboratory sample. Ensure that the ampoule is filled to two-thirds of its capacity during cooling.

Withdraw the ampoule and dry the capillary tube carefully with filter paper. Seal the end of the capillary tube, **without loss of glass,** with an oxidizing flame. Allow the capillary tube to cool, wash it with water and wipe it with filter paper until completely dry.

Weigh the sealed ampoule to the nearest 0,000 1 g and calculate, by difference, the mass of the test portion.

1) Hitherto described as "1 N sulfuric acid solution".

5.2 Determination

Carefully place the ampoule containing the test portion (5.1) into a 750 ml conical flask, fitted with a ground glass stopper, to which 50 ml of the boric acid solution (3.1), about 250 ml of water and several drops of the methyl red solution (3.3) have already been added.

Stopper the conical flask and shake carefully so as to break the ampoule. Continue shaking for about 30 s.

Unstopper the flask and rinse the stopper with water, collecting the washings in the same flask.

Using a glass rod, grind the pieces of the ampoule, in particular those parts of the capillary tube which may have remained unbroken. Remove the glass rod, rinse it with water, collecting the washings in the same flask.

Titrate with the sulfuric acid solution (3.2) until the indicator changes from yellow to red.

6 Expression of results

The concentration of the solution, expressed as a percentage by mass of ammonia (NH_3), is given by the formula

$$\frac{V \times 0{,}017\,03 \times 100}{m} = \frac{1{,}703\,V}{m}$$

where

V is the volume, in millilitres, of the standard volumetric sulfuric acid solution (3.2) used for the titration;

m is the mass, in grams, of the test portion (5.1);

0,017 03 is the mass, in grams, of ammonia (NH_3) corresponding to 1,00 ml of sulfuric acid solution, $c(1/2\ H_2SO_4) = 1{,}000$ mol/l.

NOTE — If the concentration of the standard volumetric solution used is not exactly as specified in the list of reagents, an appropriate correction should be made.

9 Test report

The test report shall include the following particulars:

a) an identification of the sample;

b) the reference of the method used;

c) the results and the method of expression used;

d) any unusual features noted during the determination;

e) any operation not included in this International Standard or regarded as optional.