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# INTERNATIONAL STANDARD



# 2749

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## Urea for industrial use — Measurement of the pH of a solution of urea of conventional concentration (100 g/l) — Potentiometric method

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**Descriptors** : ureas, chemical analysis, pH, potentiometric analysis.

## 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 2749 was drawn up by Technical Committee ISO/TC 47, *Chemistry*, and circulated to the Member Bodies in June 1972.

It has been approved by the Member Bodies of the following countries :

Austria	Israel	Sweden
Belgium	Italy	Switzerland
Bulgaria	Netherlands	Thailand
France	New Zealand	Turkey
Germany	Poland	United Kingdom
Hungary	Portugal	U.S.S.R.
India	Romania	
Ireland	South Africa, Rep. of	

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

No Member Body expressed disapproval of the document.

# Urea for industrial use — Measurement of the pH of a solution of urea of conventional concentration (100 g/l) — Potentiometric method

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a potentiometric method for the measurement of the pH of a solution, of conventional concentration, of urea for industrial use.

## 2 PRINCIPLE

Measurement at  $20 \pm 0,5$  °C of the pH of a solution of urea of conventional concentration (100 g/l) by means of a pH meter fitted with one glass electrode and one calomel electrode.

## 3 REAGENTS

Distilled water, or water of equivalent purity, recently boiled and cooled to room temperature, shall be used in the test.

### 3.1 Buffer solution, of disodium tetraborate, 0,01 M

Dissolve  $3,81 \pm 0,01$  g of disodium tetraborate decahydrate ( $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ ) in water. Transfer the solution quantitatively to a 1 000 ml one-mark volumetric flask, dilute to the mark and mix.

Store this solution away from atmospheric carbon dioxide and renew it at least monthly.

The pH of this buffer solution at 20 °C is 9,22.

### 3.2 Buffer solution, of potassium dihydrogen orthophosphate, 0,025 M, and disodiumhydrogen orthophosphate 0,025 M.

Dissolve  $3,40 \pm 0,01$  g of potassium dihydrogen orthophosphate ( $\text{KH}_2\text{PO}_4$ ) in about 400 ml of water. Dissolve separately  $3,55 \pm 0,01$  g of disodiumhydrogen orthophosphate ( $\text{Na}_2\text{HPO}_4$ ) in about 400 ml of water. Transfer the two solutions quantitatively to a 1 000 ml one-mark volumetric flask, dilute to the mark and mix.

Store this solution away from atmospheric carbon dioxide and renew it at least monthly.

The pH of this buffer solution at 20 °C is 6,88.

## 4 APPARATUS

Ordinary laboratory apparatus and

4.1 pH meter fitted with a glass electrode and a calomel electrode, sensitivity 0,05 pH unit.

## 5 PROCEDURE

### 5.1 Test portion

Weigh, to the nearest 0,01 g, 10 g of the test sample.

### 5.2 Preparation of the test solution

Transfer the test portion (5.1) to a beaker of suitable capacity (250 ml, for example). Add about 50 ml of water and stir until the sample is completely dissolved. Transfer the solution quantitatively to a 100 ml one-mark volumetric flask, dilute to the mark and mix.

### 5.3 Calibration of the pH meter

Calibrate the pH meter (4.1) at  $20 \pm 0,5$  °C, by means of the buffer solutions (3.1 and 3.2).

### 5.4 Determination

Transfer the test solution (5.2) to a dry beaker of suitable capacity. Insert the two electrodes of the pH meter (4.1) in the solution and carry out the measurement at a controlled temperature of  $20 \pm 0,5$  °C.

## 6 EXPRESSION OF RESULTS

Express the result of the measurement in pH units, to an accuracy of 0,05 unit.

## 7 TEST REPORT

The test report shall include the following particulars :

- the reference of the method used;
- the results and the method of expression used;
- any unusual features noted during the determination;
- any operation not included in this International Standard or regarded as optional.

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