INTERNATIONAL STANDARD 1842

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Fruit and vegetable products — Determination of pH

Produits dérivés des fruits et légumes — Mesurage du pH

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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.

Prior to 1972, the results of the work of the Technical Committtees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 34 has reviewed ISO Recommendation R 1842 and found it technically suitable for transformation. International Standard ISO 1842 therefore replaces ISO Recommendation R 1842-1970 to which it is technically identical.

ISO Recommendation R 1842 was approved by the Member Bodies of the following countries :

Australia	Hungary	Poland
Brazil	India	Portugal
Chile	Iran	Romania
Czechoslovakia	Israel	South Africa, Rep. of
Egypt, Arab Rep. of	Italy	Turkey
France	Netherlands	United Kingdom
Germany	New Zealand	
Greece	Peru	

No Member Body expressed disapproval of the Recommendation.

No Member Body disapproved the transformation of ISO/R 1842 into an International Standard.

Printed in Switzerland

Fruit and vegetable products — Determination of pH

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a potentiometric method of measuring pH in fruit and vegetable products.

2 PRINCIPLE

Measurement of the potential difference between two electrodes dipped in the liquid to be tested.

3 APPARATUS

3.1 pH meter, with a scale graduated in units of 0,1 pH or preferably less.

If a temperature correction system is not provided, the scale shall apply to measurements at 20 °C.

3.2 Glass electrode. Glass electrodes of different geometrical shapes may be used. They shall be stored in water.

3.3 Calomel electrode, containing saturated potassium chloride solution.

Store the calomel electrode according to the instructions of the manufacturer; if these are not available, the electrode shall be stored in saturated potassium chloride solution.

NOTE — The calomel and glass electrodes may also be assembled into a system of combined electrodes. Store this in water. The level of the saturated potassium chloride solution in the calomel electrode shall be above the water level.

4 PROCEDURE

4.1 Preparation of sample

4.1.1 *Liquid products and easily filtrable products* (for example, juices, liquids from compotes or from pickles, brines, fermented liquids, etc.)

Mix the laboratory sample carefully until it is homogeneous.

4.1.2 *Thick or semi-thick products and products from which it is difficult to separate the liquid* (for example, syrups, jams, purées, jellies, etc.)

Mix a part of the laboratory sample and grind it in a blender or mortar; if the product obtained is still too thick, add an equal mass of distilled and freshly boiled water.

4.1.3 *Frozen products*

After thawing the product and removing stones and hard seed-cavity walls, proceed as described in 4.1.1 or 4.1.2, as appropriate.

4.1.4 *Dried products*

Cut a part of the laboratory sample into small pieces, and remove stones and hard seed-cavity walls. Put the pieces into a beaker, add 2 to 3 times their mass of distilled water (or more if required to give a suitable consistency) and heat in a water bath for 30 min, mixing from time to time with a rod. Then disintegrate the product in a blender or mortar.

4.1.5 *Freshly prepared products comprising distinct solid and liquid phases*

Proceed as described in 4.1.2.

4.2 Test portion

Use as the test portion a volume of the prepared sample sufficient for immersion of the electrodes, according to the apparatus used.

4.3 Calibration of the pH meter

Calibrate the pH meter, using a buffer solution of exactly known pH, as near as possible to the pH of the solution to be determined (see clause 6), at the temperature of measurement.

If the pH meter does not include a temperature correction system, the temperature of the buffer solution shall be within the range 20 ± 2 °C.

4.4 Determination

Introduce the electrodes into the test portion and set the temperature correction system of the pH meter to the temperature of measurement. If there is no temperature correction system, the temperature of the test portion shall be within the range 20 ± 2 °C.

Make the determination using the procedure appropriate to the pH meter used. Read the pH directly from the scale on the instrument, to the nearest 0,05 pH unit, when a constant value has been reached.

Perfom at least two determinations on the same prepared sample.

5 EXPRESSION OF RESULTS

5.1 Method of calculation

Take as the result the arithmetic mean of the two determinations, if the requirement concerning repeatability (see 5.2) is satisfied. Report the result to the nearest 0,05 pH unit.

5.2 Repeatability

The difference between the results of two determinations carried out in rapid succession by the same analyst should not exceed 0,1 pH unit.

6 NOTE ON PROCEDURE

The following buffer solutions can be used for calibration:

6.1 Buffer solution with pH 3,57 at 20 °C, prepared as follows :

Saturate water at 25 °C with potassium hydrogen tartrate ($KHC_4H_4O_6$) of analytical reagent quality.

The pH of this solution is 3,56 at 25 °C and 3,55 at 30 °C.

6.2 Buffer solution with pH 6,88 at 20 °C, prepared as follows :

Weigh, to the nearest 0,001 g, 3,402 g of potassium dihydrogen orthophosphate (KH_2PO_4) and 3,549 g of disodium hydrogen orthophosphate (Na_2HPO_4) and dissolve in 1 000 ml of distilled water at 20 °C.

The pH of this solution is 6,92 at 10 °C and 6,85 at 30 °C.

6.3 Buffer solution with pH 4,00 at 20 °C, prepared as follows :

Weigh, to the nearest 0,001 g, 10,211 g of potassium hydrogen phthalate ($KH[C_6H_4(COO)_2]$), dried for 1 h at 105 °C, and dissolve it in 1000 ml of distilled water at 20 °C.

The pH of this solution is 4,00 at 10 °C and 4,01 at 30 °C.

6.4 Buffer solution with pH 5,00 at 20 °C (for example, a 0,1 M solution of disodium hydrogen citrate ($Na_2HC_6H_5O_7$) of analytical reagent quality).

7 TEST REPORT

The test report shall show the method used and the result obtained. It shall also mention any operating conditions not specified in this International Standard, or regarded as optional, and any circumstances that may have influenced the result.

The report shall include all details required for the complete identification of the sample.