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Wheat — Determination of the sedimentation index — Zeleny test

Blé tendre — Détermination de l'indice de sédimentation — Test de Zélény

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5529 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 4, *Cereals and pulses*.

This third edition cancels and replaces the second edition (ISO 5529:1992), which has been technically revised.

Wheat — Determination of the sedimentation index — Zeleny test

1 Scope

This International Standard describes a method, known as the Zeleny sedimentation test, for assessing one of the factors determining the quality of wheat as a means of predicting the baking strength of the flour which can be made from it.

The method is applicable only to *Triticum aestivum* L. wheat.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 648, *Laboratory glassware — One-mark pipettes*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
sedimentation index
number indicating the volume of the sediment obtained, under the conditions specified in this International Standard, from a suspension of test flour, prepared from the wheat, in a solution of lactic acid and propan-2-ol

NOTE 1 The sedimentation index is determined by the Zeleny test.

NOTE 2 The volume is expressed in millilitres.

4 Principle

The measurement principle is based on the ability of the flour proteins to swell in an acid medium.

Test flour, prepared from wheat under specified grinding and sieving conditions, is suspended in a solution of lactic acid and propan-2-ol in the presence of a dye. After specified shaking and rest times, the obtained sediment volume corresponds to the sedimentation of the flour particles.

5 Reagents

Use reagents of recognized analytical grade, unless otherwise specified, and water complying with grade 2 in accordance with ISO 3696, unless otherwise stated.

5.1 Reagents for the sedimentation test

5.1.1 Lactic (2-hydroxypropanoic) **acid solution**, at an aqueous volume fraction of 90 %, M = 90,08 g/mol, d = 1,20 to 1,22.

5.1.2 Propan-2-ol, at a volume fraction of 99 % to 100 %, M = 60,10 g/mol.

5.1.3 Sodium hydroxide, standard solution, ρ(NaOH) = 40 g/l.

5.1.4 Bromophenol blue, $C_{19}H_{10}Br_4O_5S$, solution.

In a 1 000 ml volumetric flask (6.6), dissolve 4 mg of bromophenol blue in water, then make up to the mark with water.

5.1.5 Phenolphthalein, $C_{20}H_{14}O_4$, solution.

In a 100 ml volumetric flask (6.7), dissolve 1 g of phenolphthalein in ethanol at an aqueous volume fraction of 95 % to 96 %, then make up to the mark with ethanol.

5.2 Preparation of the solutions

5.2.1 Lactic acid stock solution

Pour 235 ml of lactic acid solution (5.1.1) into a 1 000 ml volumetric flask (6.6) and adjust to the mark with water. Transfer the solution to the flask (6.8) and place the latter on the heating mantle (6.9). Bring to the boil and reflux for 6 h.

Concentrated lactic acid solution contains associated molecules which, on dilution, dissociate slowly to equilibrium. Boiling accelerates this dissociation process which is essential in order to obtain reproducible sedimentation values.

Leave to cool for at least 2 h prior to titration. Then titrate (6.12) 10 ml of this solution against sodium hydroxide (5.1.3) using phenolphthalein (5.1.5) as indicator (10 ml of lactic acid solution require about 28 ml of sodium hydroxide). The concentration found shall be between 2,7 mol/l and 2,8 mol/l.

Store the lactic acid stock solution in a tinted glass bottle.

5.2.2 Test solution

In a 1 000 ml volumetric flask (6.6), mix 180 ml of the lactic acid stock solution (5.2.1) and 200 ml of propan-2-ol (5.1.2), then make up to the mark with water.

Store in a stoppered bottle. After preparation, only use the reagent after it has stood for a minimum of 48 h and within a maximum period of 15 days.