

Markundersökningar – Bestämning av pH
(ISO 10390:2005, IDT)

Soil quality – Determination of pH
(ISO 10390:2005, IDT)

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Denna standard ersätter SS-ISO 10390, utgåva 1.

The International Standard ISO 10390:2005 has the status of a Swedish Standard. This document contains the official English version of ISO 10390:2005.

This standard supersedes the Swedish Standard SS-ISO 10390, edition 1.

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Foreword

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ISO 10390 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical methods and soil characteristics*.

This second edition cancels and replaces the first edition (ISO 10390:1994), which has been technically revised.

Soil quality — Determination of pH

1 Scope

This International Standard specifies an instrumental method for the routine determination of pH using a glass electrode in a 1:5 (volume fraction) suspension of soil in water (pH in H₂O), in 1 mol/l potassium chloride solution (pH in KCl) or in 0,01 mol/l calcium chloride solution (pH in CaCl₂).

This International Standard is applicable to all types of air-dried soil samples, for example pretreated in accordance with ISO 11464.

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 1770:1981, *Solid-stem general purpose thermometers*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*

3 Principle

A suspension of soil is made up in five times its volume of one of the following:

- water;
- a solution of potassium chloride (KCl) in water, $c = 1$ mol/l;
- a solution of calcium chloride (CaCl₂) in water, $c = 0,01$ mol/l.

The pH of the suspension is measured using a pH-meter.

NOTE To make the procedure generally applicable to all types of soil samples, a volume-to-volume shaking ratio is chosen because then all soils can be treated in the same way. If a mass-to-volume ratio were chosen, the weighed amount of test sample would have to be adapted for soils with a low density, to enable the preparation of the suspension. For the purpose of this International Standard, taking the required volume of test portion with a measuring spoon is sufficiently accurate.

4 Reagents

Use only reagents of recognized analytical grade.

4.1 Water, with a specific conductivity not higher than 0,2 mS/m at 25 °C and a pH greater than 5,6 (grade 2 water in accordance with ISO 3696:1987).

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4.2 Potassium chloride solution, $c(\text{KCl}) = 1 \text{ mol/l}$

Dissolve 74,5 g of potassium chloride in water (4.1) and dilute to 1 000 ml.

4.3 Calcium chloride solution, $c(\text{CaCl}_2) = 0,01 \text{ mol/l}$

Dissolve 1,47 g of calcium chloride dihydrate ($\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$) in water (4.1) and dilute to 1 000 ml.

4.4 Buffer solutions, for calibration of the pH-meter

Use at least two of the following buffer solutions for calibration. Buffer solutions having a similar or equivalent pH that are commercially available may also be used.

NOTE The buffer solutions 4.4.1, 4.4.2 and 4.4.3 are stable for one month when stored in polyethylene bottles.

4.4.1 Buffer solution, pH 4,00 at 20 °C

Dissolve 10,21 g of potassium hydrogen phthalate ($\text{C}_8\text{H}_5\text{O}_4\text{K}$) in water (4.1) and dilute to 1 000 ml.

The potassium hydrogen phthalate shall be dried before use for 2 h at $115 \text{ °C} \pm 5 \text{ °C}$.

4.4.2 Buffer solution, pH 6,88 at 20 °C

Dissolve 3,39 g of potassium dihydrogen phosphate (KH_2PO_4) and 3,53 g of disodium hydrogen phosphate (Na_2HPO_4) in water (4.1) and dilute to 1 000 ml.

The potassium dihydrogen phosphate shall be dried before use for 2 h at $115 \text{ °C} \pm 5 \text{ °C}$.

4.4.3 Buffer solution, pH 9,22 at 20 °C

Dissolve 3,80 g of disodium tetraborate decahydrate ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$) in water (4.1) and dilute to 1 000 ml

NOTE Disodium tetraborate decahydrate may lose water of crystallization when stored for a long time.

5 Apparatus

5.1 Shaking or mixing machine

5.2 pH-meter, with slope adjustment and temperature control

5.3 Glass electrode and reference electrode, or combined electrode of equivalent performance

In the case of pH values greater than 10, an electrode specifically designed for that range should be used.

NOTE In soil systems, the danger of deterioration of performance caused by breakage or contamination of the electrodes is increased.

5.4 Thermometer or temperature probe, capable of measuring to the nearest 1 °C, complying with type C according to ISO 1770:1981.

5.5 Sample bottle, of capacity at least 50 ml, made of borosilicate glass or polyethylene with a tightly fitting cap or stopper.

5.6 Spoon, of known capacity of at least 5,0 ml.