SLOVENSKI STANDARD
oSIST prEN ISO 19396-1:2024

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Barve in laki - Določanje pH-vrednosti - 1. del: pH-elektrode s stekleno membrano (ISO/DIS 19396-1:2024)

Paints and varnishes - Determination of pH value - Part 1: pH electrodes with glass membrane (ISO/DIS 19396-1:2024)

Beschichtungsstoffe - Bestimmung des pH-Wertes - Teil 1: pH-Elektroden mit Glasmembran (ISO/DIS 19396-1:2024)

Peintures et vernis - Détermination de la valeur de pH - Partie 1: Électrodes de pH à membrane en verre (ISO/DIS 19396-1:2024)

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87.040	Barve in laki	Paints and varnishes

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Paints and varnishes — Determination of pH value —

Part 1: pH electrodes with glass membrane

Peintures et vernis — Détermination de la valeur de pH —

Partie 1: Électrodes de pH à membrane en verre

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This second edition cancels and replaces the first edition (ISO 19396-1:2017), which has been technically revised.

The main changes are as follows:

— definitions for “theoretical slope” and “stability of measured value” have been deleted;

— “measuring medium” has been harmonized to “measuring solution” in the entire text;

— the calibration (7.2) has been clarified;

— the normative references have been updated.

A list of all parts in the ISO 19396 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The pH value of aqueous products is of decisive importance for the product properties and durability.

Paints and varnishes — Determination of pH value —

Part 1:
pH electrodes with glass membrane

1 Scope

This document specifies a method for laboratory measurement of the pH value of polymer dispersions and coating materials using pH electrodes with a glass membrane. ISO 19396-2 specifies a method for measuring the pH value using pH electrodes with ion-sensitive field-effect transistor (ISFET) technology.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1513, *Paints and varnishes — Examination and preparation of test samples*

ISO 4618, *Paints and varnishes — Vocabulary*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

ISO 80000-9, *Quantities and units — Part 9: Physical chemistry and molecular physics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618, ISO 80000-9 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
pH
measure for the acidic or basic reaction of an aqueous solution or polymer dispersion

Note 1 to entry: Notation of pH: the p and the H are vertically on one line. The same is valid for pOH.

Note 2 to entry: The acidic reaction is determined by the activity of the existing “hydrogen ions”. The basic reaction is determined by the activity of the existing hydroxide ions. The direct relationship between the activities of the “hydrogen ions” and the hydroxide ions is described by the ionic product of the water.

3.2
pH value
decadal logarithm of the hydrogen ion activity multiplied with (–1)

$$\mathrm{pH} = \mathrm{p}a_{\mathrm{H}^+} = -\lg\left(\frac{a_{\mathrm{H}^+}}{m^0}\right) = -\lg\left(\frac{m_{\mathrm{H}^+}\cdot\gamma_{\mathrm{H}^+}}{m^0}\right)$$

with $a_{H^+} = m_{H^+} \cdot \gamma_{H^+}$

where

a_{H^+} is the activity of the hydrogen ion, in mol/kg;

m^0 is the standard molality (1 mol/kg);

γ_{H^+} is the activity coefficient of the hydrogen ion;

m_{H^+} is the molality of the hydrogen ion, in mol/kg.

Note 1 to entry: The pH value is not measurable as a measure of a single ion activity. Therefore, pH (PS) values of solutions of primary reference material (PS, en: Primary Standard) are determined, which are approximate to it and can be attributed to it.

3.3
potentiometric measuring chain
combination of electrochemical half cells

3.4
pH (combination) electrode
pH (single-rod) measuring chain
potentiometric measuring chain (3.3) providing a voltage which depends on the *pH value* (3.2) of the measuring solution

Note 1 to entry: One of the two electrochemical half cells is the pH measuring electrode, the second is a *reference electrode* (3.5) (see Figure 1). Both electrodes can be combined as a single-rod measuring chain in one unit.

Note 2 to entry: An integrated temperature sensor is recommended (see Figure 1).