
**Paints and varnishes — Determination
of pH value —**

**Part 2:
pH electrodes with ISFET technology**

Peintures et vernis — Détermination de la valeur pH —

Partie 2: Électrodes pH avec technique ISFET

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Contents

	Page
Foreword.....	iv
Introduction.....	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	5
5 Apparatus and materials	5
6 Sampling	8
7 Procedure	9
7.1 Test conditions.....	9
7.2 Calibration.....	9
7.3 Number of determinations.....	9
7.4 Measuring the pH value.....	9
8 Evaluation	9
9 Precision	10
9.1 General.....	10
9.2 Repeatability limit, r	10
9.3 Reproducibility limit, R	10
10 Test report	10
Annex A (informative) Determination of precision	11
Bibliography	13

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.

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on 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 the following URL: 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*.

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

Introduction

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

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Paints and varnishes — Determination of pH value —

Part 2: pH electrodes with ISFET technology

1 Scope

This document specifies a method for measuring the pH value of dispersions and coating materials using pH electrodes with ion-sensitive field-effect transistor (ISFET) technology. ISO 19396-1 specifies a method for measuring the pH value using pH electrodes with a glass membrane.

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 — Terms and definitions*

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

ISO 80000-9:2009, *Quantities and units — Part 9: Physical chemistry and molecular physics*

3 Terms and definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

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.

[SOURCE: ISO 19396-1:2017, 3.1]

3.2

pH value

decadal logarithm of the hydrogen ion activity multiplied with (−1)

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