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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 39482.1-2023

**Electrochemical impedance spectroscopy(EIS) on coated and
uncoated metallic specimens - Part 1: Terms and definitions**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 1 of GB/T 39482 "Electrochemical Impedance Spectroscopy (EIS) of Painted and Unpainted Metal Specimens". GB/T 39482

The following sections have been published.

---Part 1. Terms and definitions;

---Part 3. Processing and analysis of data obtained from simulated electrolytic cells.

This document is equivalent to ISO 16773-1:2016 "Electrochemical impedance spectroscopy (EIS) of painted and unpainted metal specimens - Part 1. Techniques"

Phrases and Definitions.

This document adds a chapter "Normative References" and an "Index".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

GB/T 39482 describes the application of electrochemical impedance spectroscopy (EIS).

Although this document was originally developed for coatings and is primarily

Parts are for coatings, but general guidelines can also be applied to unpainted specimens. For unpainted specimens, the ISO /

More information is found in TR16208.

GB/T 39482 aims to describe the application of electrochemical impedance spectroscopy

(EIS) and is intended to consist of four parts.

---Part 1. Terms and definitions. Terms and definitions used in electrochemical impedance spectroscopy are defined.

---Part 2. Data collection. Describes an experimental procedure for testing laboratory instruments for acquisition and presentation under potentiostatic control

The following collection focuses on EIS data of high-resistance organic coatings on metal surfaces. Specifies simulations for simulating the characteristics of high-impedance systems

Cell. Test procedures and setup parameters for collecting impedance data from simulated electrolytic cells and coated metal specimens are given.

number. A procedure is outlined for comparing recorded spectra using theoretical data from a simulated electrolytic cell in order to establish an acceptable

Guidelines for developing instrument precision and limitations. No guidance on data interpretation is provided.

---Part 3. Processing and analysis of data obtained from simulated electrolytic cells. Specifies a method for evaluating high-resistance painted specimens

Procedures for the EIS test device, and acceptance criteria for the obtained values are given.

---Part 4. Examples of spectra for coated and uncoated polymer samples. Is informative in nature and includes the resistance of coated metal specimens

Some background on antispectral studies and some typical spectrum examples of actual coatings.

ISO /T R16208 describes the basic principles of electrochemical impedance spectroscopy (EIS), with a particular focus on corrosion of metallic materials. It also involves how

Use electrochemical equipment, set up and connect electrical instruments, display measurement data, and analyze results.

Painted and unpainted metal specimens

Electrochemical Impedance Spectroscopy (EIS)

Part 1. Terms and Definitions

1 Scope

This document defines the terms and definitions used in electrochemical impedance spectroscopy (EIS) in other parts of GB/T 39482.

2 Normative reference documents

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

peak-to-peak amplitude

2U₀

The maximum difference between the maximum and minimum excitation signals in the applied AC disturbance signal.

Note. Peak-to-peak amplitude is usually expressed in millivolts (mV).

3.2

Root mean square amplitude

U_{rms}

The root mean square (i.e. effective) value of the applied AC disturbance signal.

Note. That is the peak-to-peak value of AC amplitude divided by $(2\sqrt{2})$.

3.3

Bodeplot

The relationship curve (a) between the phase angle (3.36) and the logarithm of the applied frequency, and the logarithm of the impedance magnitude (3.28) $|Z|$ and the logarithm of the applied frequency

Relationship curve (b).

3.4

R_{ct}

The resistance of a resistor that represents the properties of the metal-electrolyte interface in the equivalent circuit (3.18).

Note. Charge transfer resistance is usually expressed in ohms (ohm). Charge transfer resistivity is usually expressed in ohms square centimeters (ohm.cm²).

3.5

coating

A layer of paint applied to a substrate in one or more applications.

[Source. ISO 4618:2014, 2.50.1]

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