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Accelerated life test method of mixed metal oxide anodes for cathodic protection —

Part 2: Application in soils and natural waters

Méthode d'essai accéléré de durabilité des anodes à oxydes métalliques mixtes pour la protection cathodique —

Partie 2: Application dans les sols et aux naturelles

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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).

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 156, *Corrosion of metals and alloys*.

A list of all the parts in the ISO 19097 series can be found on the ISO website.

Introduction

Impressed current cathodic protection (ICCP) is an effective method to control corrosion of metallic structures immersed in seawater, brackish water, and fresh water or buried in soil. ICCP is also widely applied to prevent steel reinforcement in concrete from corrosion in marine or other chloride contaminated environment.

Mixed metal oxide (MMO) anodes have been widely taken as impressed current anodes in the ICCP system due to their good electrocatalytic activity, low consumption rate, long service life, light weight, malleability, high ratio of performance to cost, and wide suitability for different electrolytes.

Durability is one of the most important properties of MMO anodes. ISO 19097 (all parts) examines the accelerated life test method of MMO anodes for cathodic protection to evaluate the anode's ability to achieve an expected lifetime. The accelerated lifetime can also be used to compare the stability of different MMO anodes. This document is applicable to MMO anodes intended for use in underground or underwater environments. This method is not intended to give the exact service life of the anodes in the practical applications, but to provide users and manufacturers of MMO anodes a way to evaluate whether the designed life expectancy can be achieved.

Large portions of this document were derived from NACE International Standard TM0108-2012[1].

Accelerated life test method of mixed metal oxide anodes for cathodic protection —

Part 2: Application in soils and natural waters

1 Scope

This document specifies accelerated life test method of mixed metal oxide anodes for impressed current cathodic protection used in soil or natural waters. The accelerated life test results can be used to compare the durability of the anodes and to evaluate whether the anodes can comply with required specifications of design life expectancy at rated current output.

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 8044, *Corrosion of metals and alloys — Basic terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8044 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 https://www.iso.org/obp

3.1
mixed metal oxide anode
impressed current anode for cathodic protection consisting of conductive coating of mixed metal oxides formed on titanium substrate

Note 1 to entry: The most common mixture used for cathodic protection is iridium oxide and tantalum oxide. Exact compositions may vary.

3.2
accelerated life
lifetime of *mixed metal oxide anode* (3.1) under accelerated testing condition, usually in the specific electrolyte applied with large current density

Note 1 to entry: The total period of testing until the deactivation of the mixed metal oxide anode is taken as the accelerated life.

3.3
cell voltage
voltage between anode and cathode in a single cell