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**Corrosion of metals and alloys - Electrochemical methods for
fast test of stress corrosion cracking susceptibility**

金属和合金的腐蚀 应力腐蚀敏感性电化学快速试验方法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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Corrosion of metals and alloys Electrochemical rapid test method for stress corrosion susceptibility

1 Scope

This document specifies the principles, sample preparation, test solution, and method for the rapid electrochemical test of stress corrosion cracking susceptibility of metals and alloys.

liquid, test equipment, test procedures, test result processing and test report.

This document applies to the stress corrosion cracking sensitivity of carbon steel, low alloy steel, stainless steel and other metals and alloys in aqueous solution environment at room temperature. Quick test.

2 Normative references

GB/T 6682

GB/T 10123

3 Terms and Definitions

The terms and definitions defined in GB/T 10123 and the following apply to this document.

3.1 Fast scan rate fastscanrate

The scan rate is greater than 50 mV/s when the potential scan rate is controlled.

3.2 slow scan rate slowscanrate

The scan rate is less than 0.5 mV/s when the potential scan rate is controlled.

3.3

Polarization current density at fast scan rate (3.1).

3.4

Polarization current density at slow scan rate (3.2).

4 Principles

4.1 The difference and relationship between the fast scan current density if and the slow scan current density is under different electrode potential conditions can be used to quickly test Stress corrosion cracking (SCC) sensitivity. This method is based on the non-steady-state electrochemical theoretical model of SCC. Fast scan rate polarization curve During the test, the electrochemical state of the sample surface can reach an unstable state controlled by the limiting diffusion, which can be equivalent to the SCC tip dislocation activation.

The kinetic characteristics of the non-steady-state electrochemical process in the limiting diffusion state. When the slow scan rate polarization curve is tested, the electrode surface can maintain sufficient