

Stress Corrosion Cracking Behavior of High Strength Aluminum Alloy in Simulated Marine Environment

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Abstract 2050 high-strength aluminum alloy has high specific strength and excellent mechanical properties, which has good application prospects in aviation, aerospace, shipbuilding and other fields. As a structural material, 2050 high-strength aluminum alloy is subjected to the combined effects of load and medium environment. The stress corrosion cracking of 2050 high-strength aluminum alloy can easily lead to catastrophic accidents and huge economic losses, which has attracted widely attention. Therefore, the study of stress corrosion cracking behavior and mechanism of 2050 high-strength aluminum alloy has important practical significance.

In this study, the stress corrosion cracking behavior of 2050 high-strength aluminum alloy with different load was researched. The relationship between load and time of fracture was established. As the load decreased from 428 MPa to 338 MPa, the time of fracture increased from 72.0 h to 131.2 h. The sensitivity of stress corrosion cracking gradually decreased with the decrease of load. 2050 high-strength aluminum alloy occurred stress corrosion cracking under the combined effects of load and medium environment. The process of stress corrosion cracking of 2050 high-strength aluminum alloy was both influenced by anodic dissolution and hydrogen induced cracking mechanisms.

Keywords Stress corrosion cracking, 2050 high-strength aluminum alloy, Behavior, Mechanism

Reference

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