Short Communication

Influence of aging time on the corrosion behavior of 6061-T6 aluminum alloy in NaCl solution

Jinlin Yang¹, Baozhu Zhao^{1,*}, Min Zhu^{1,*}, Li Liu², Xiang Zhang³

¹ School of Mechanical Engineering & Automation, Zhejiang Sci-Tech University, Hangzhou 310018, PR China

² Interplex Electronic (HZ) Co., Ltd, Hangzhou 310018, China

³ Zhejiang Zheneng Natural Gas Operation Co. Ltd., Hangzhou, Zhejiang; 310052, China

*E-mail: zmii666@126.com, 283396849@qq.com

Received: 18 August 2021 / *Accepted:* 27 September 2021 / *Published:* 10 November 2021

In this work, the study on the influence of aging time on the microstructure and corrosion behavior of 6061-T6 aluminum alloy in NaCl solution was systematically investigated using a series of testing methods. In the corrosion process, the two identified precipitates play different roles in the micro-galvanic corrosion cell formed with the matrix. Among them, the precipitate β serves as the anode to protect the matrix, whereas the precipitate Q causes an opposite corrosive effect. The anti-corrosion resistance of the alloy first increases and then decreases as the aging time increases. The low number of Q phase precipitates distributed within the microstructures can improve the anti-corrosion property of samples aged for 6 and 8 h. The change trend in the anti-corrosion property of alloy samples aged for different times is mainly dependent on the content of precipitate β . Therefore, the alloy sample aged for 6h possesses the best corrosion resistance because it has the highest content of precipitate β and low content of Q phase.

Keywords: Aging time; corrosion behavior; microstructure; 6061 aluminum alloy

[FULL TEXT](#)

© 2021 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).