Int. J. Electrochem. Sci., 17 **(2022)** Article Number: 220851, doi: 10.20964/2022.08.51

International Journal of
ELECTROCHEMICAL
SCIENCE
www.electrochemsci.org

Short Communication

Effect of Different Sealing Treatments of Oxide Films on Corrosion Resistance of Anodized ZL101A Aluminum Alloy in Simulated Marine Atmospheric Environment

Huarui Zhao[1,*], *Xinghua Chen*[1], *Xinjieyuan*[1], *Lilizhou*[1], *Xinliang Wang*[2]

[1] Xinxiang Vocational and Technical College, Xinxiang 453000, China;
[2] Xinxiang College, Xinxiang 453000, China
[*]E-mail: Zhao_edu453@126.com

Received: 17 April 2022 / *Accepted:* 9 June 2022 / *Published:* 4 July 2022

In order to further improve the corrosion resistance of ZL101A aluminum alloy, which is commonly used in automobiles, an anodic oxide film was prepared on the surface of ZL101A aluminum alloy by conventional anodizing process, followed by sealing treatment in a mixed solution containing nickel salt and cerium salt. The protection effect of the conventional anodic oxide film and sealed anodic oxide films on ZL101A aluminum alloy in simulated marine atmospheric environment were investigated. The results show that after boiling water sealing, nickel salt sealing and synergistic sealing with nickel salt and cerium salt, the surface composition and phase of conventional anodic oxide film change. The reaction products generated during sealing fill the defects of anodic oxide film due to volume expansion and deposition effect resulting in the improvement of the corrosion resistance. After synergistic sealing with nickel salt and cerium salt, hydrated alumina, hydroxide precipitate and cerium hydroxide precipitate are simultaneously generated to play multiple sealing functions. Therefore, the anodic oxide film after synergistic sealing with nickel salt and cerium salt possesses the best corrosion resistance, and it plays a good protective role, allowing ZL101A aluminum alloy to meet the high requirements of application in simulated marine atmospheric environment.

Keywords: Simulated marine atmospheric environment; Anodic oxide film; Corrosion resistance; ZL101A aluminum alloy; Protection effect

FULL TEXT