Short Communication

Galvanic Corrosion Behavior of Aluminum Alloy (2219 and ZL205A) Coupled to Carbon Fiber-Reinforced Epoxy Composites

Shiwen Zou1,*, Yanxian Zhang2, Wen Xu1, Yingqi Wan2, Chang He2, Chaofang Dong2, Xiaogang Li2

1 Aerospace Research Institute of Materials and Processing Technology, Beijing 100076, China
2 Corrosion and Protection Center, Key Laboratory for Corrosion and Protection (MOE), University of Science and Technology Beijing, Beijing 100083, China
*E-mail: zoushiwen908@163.com

doi: 10.201964/2016.11.25

Received: 8 May 2016 / Accepted: 1 September 2016 / Published: 10 October 2016

The galvanic corrosion behaviors between carbon fiber-reinforced epoxy composites (CFREC) and aluminum alloy (2219 and ZL205A) in 3.5 wt.% sodium chloride solutions were evaluated by laboratory electrochemical measurement. The corrosion morphology, products and galvanic currents of galvanic couples were measured. The results indicate that there were serious galvanic corrosion when these two kinds of materials were coupled for 10 hours in 3.5 wt.% NaCl solution, corrosion pits and grooves can be clearly observed on both aluminum alloys; the galvanic current of 2219 is slightly higher than that of ZL205A which both decrease with time; the average galvanic current density of 2219 and ZL205A is 20.19 μA·cm⁻² and 16.08 μA·cm⁻² respectively; as a result, two types of aluminum alloys are not allowed to contact with CFREC directly in hygrothermal salt spray environment.

Keywords: galvanic corrosion, carbon fiber-reinforced epoxy composites, aluminum alloy

© 2016 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/).