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Poster Oral

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A homemade electrochemical hanging droplet cell to evaluate the corrosion resistance of friction stir weld zones of the AA2198-T8 Al-Cu-Li alloy

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Abstract

In this study, the corrosion resistance of the different zones of the AA2198-T8 alloy welded using friction stir welding (FSW) was investigated by immersion and electrochemical tests during exposure to 0.005 mol L⁻¹ NaCl solution. After immersion tests, the welding zones were classified in two groups, according to their severe localized corrosion (SLC) morphology. Zones exposed to higher temperatures during welding presented intergranular attack, whereas those exposed to lower temperatures presented intragranular attack. Electrochemical measurements performed employing a homemade hanging droplet cell revealed potential galvanic coupling between the two groups. The base metal (BM) presented the most anodic potentials. The open circuit potential (OCP) increased from BM towards the stir zone (SZ). The results obtained by the hanging droplet cell were reproducible and coherent with the classification of the zones in the two proposed groups. The homemade electrochemical hanging droplet cell proved a very reliable tool to investigate the electrochemical behavior of the FSWed zones in Al-Cu-Li alloys.

Keywords: hanging droplet cell; aluminum alloys; friction stir welding; electrochemical techniques; severe localized corrosion

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