The Effect of Heat Treatment on Corrosion Resistance of 6061 Aluminum Alloy

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In this paper, the corrosion resistance in 3.5% NaCl solution of 6061 aluminum alloys after different heat treatment is investigated by slow strain rate equipment, polarization curves and impedance, combining scanning electron microscopy. The results showed that the results of three methods are consistent. The tensile fracture time of the alloy after solution treatment is longest, the one of alloy after dual-stage aging is shorter, and the one of alloy after single-stage aging is shortest; the passivation film of alloy after solution treatment is most stable, with the largest value of impedance, the passivation film of dual-stage aged and single-stage aged alloys are poorly stable, the impedance values are lower. Dual-stage aging makes the second phases coarser, cutting off continuous anodic dissolution channel and owing a smaller current density than single-stage aging alloys.

Keywords: 6061 aluminum alloy; heat treatment; slow strain rate; polarization curves; impedance

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