Advanced Materials Research, vol. 795, 2013, pages 535-539

Corrosion behavior of Al-Cu-Ni-Y alloys

Abstract

Al based alloy has been widely used in various industries. This research paper aims at the investigation onto the effect of the percentage of Cu and Ni alloying elements in the corrosion behavior of Al-Cu-Nialloys. The alloys were characterized by microstructural analysis, physical properties analysis, electrochemical analysis, and phase analysis. By observing the microstructure of the samples, it shows that the dendritic microstructures are occurs. The addition of Ni reveals columnar twinned dendritic to the longitudinal direction of cast ingots. While the addition of Cu increases the density of the sample. The Vickers microhardness test shows that the sample Al86- Ni5-Cu3-Y6 reached the optimum of the hardness value which is 51.36 HV. Tafel Plot that performed shows that Al86-Ni5-Cu3-Y6 has the highest Polarization Resistance, Rp, 2 031.82 kΩ and lowest corrosion rate, 0.00380 mm per year. An alloy with high Rp value is highly resistant to corrosion.

Keywords

Aluminium alloy; Corrosion and copper; Nickel