

Studi karakterisasi anoda korban paduan al-zn-in dengan menggunakan metode electrochemical impedance spectroscopy = Characterization study of al-zn-in sacrificial anode using electrochemical impedance spectroscopy method / Derry Rahma Yoda

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Abstrak

Studi perilaku elektrokimia dari anoda korban paduan aluminium Al-xZn dan Al-xZn-yIn diteliti pada larutan NaCl 3,5% dengan menggunakan metode electrochemical impedance spectroscopy (EIS). Hasil penelitian menunjukkan bahwa anoda Al-5Zn memiliki diameter kurva semicircle paling kecil diantara anoda paduan Al-xZn yang lain. Begitupula dengan adanya kehadiran indium pada anoda paduan Al-xZn membuat diameter kurva semicircle yang diperoleh menjadi semakin kecil. Berdasarkan hasil pencocokan kurva Nyquist dengan model sirkuit ekuivalen, didapatkan hasil bahwa nilai Rct paling kecil diantara anoda Al-xZn dimiliki oleh Al-5Zn, yaitu $R_{ct} = 9008 \ \Omega$. Kehadiran indium pada anoda Al-5Zn-0.02In juga membuat nilai tahanan transfer muatan yang diperoleh menjadi semakin kecil, dimana nilai $R_{ct} = 2400 \ \Omega$. Hasil ini menunjukkan bahwa penambahan unsur Zn dan adanya kehadiran In dalam anoda paduan aluminium akan membuat nilai tahanan transfer muatan (R_{ct}) menjadi semakin berkurang, sehingga laju korosi atau laju disolusi dari Al menjadi semakin meningkat.

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Electrochemical behaviour study of aluminium sacrificial anode Al-xZn and Al-xZn-yIn was investigated in 3.5 wt.% NaCl solution by using electrochemical impedance spectroscopy. The result of EIS tests showed that Al-5Zn alloy has a semicircle curve with the smallest diameter between the others sacrificial anode. Similarly, the presence of indium makes the diameter of semicircle curve that was obtained becomes smaller. Based on the results of nyquist curve fitting with equivalent circuits model, the result showed that the value of smallest Rct between Al-xZn sacrificial anode was owned by Al-5Zn, $R_{ct} = 9008 \ \Omega$. The presence of indium in Al-5Zn-0.02In sacrificial anode also makes the value of charge transfer resistance (R_{ct}) that was obtained becomes smaller, where the value of $R_{ct} = 2400 \ \Omega$. These result indicate that the addition of zinc element and the presence of indium in aluminium sacrificial anode will make charge transfer resistance value decreases, so the corrosion rate or dissolution rate of aluminum became increases.