

Studi pengaruh konsentrasi larutan NaCl terhadap ketahanan korosi pada baja tahan karat austenitik 304l menggunakan metoda polarisasi siklik = Corrosion behavior of austenitic stainless steel 304l in aqueous sodium chloride solution by cyclic polarization method

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Abstrak

Penelitian tentang perilaku dan ketahanan korosi pada baja tahan karat austenitik seri 304L telah dilakukan pada variasi konsentrasi larutan NaCl terkait dengan ketahanannya pada korosi sumuran. Penelitian dilakukan dengan metode polarisasi siklik pada temperatur ruang untuk mengevaluasi perilaku korosi yang terjadi dengan mempertimbangkan faktor potensial korosi Ecor dan potensial proteksi Ep. Larutan NaCl yang digunakan pada pengujian memakai konsentrasi sebesar 1, 2, 3.5, 4, dan 5. Representasi hasil percobaan polarisasi siklik didapatkan melalui grafik polarisasi siklik baja tahan karat austenitik seri 304L yang menunjukkan nilai dari potensial korosi Ecor dan potensial proteksi Ep.

Hasil yang didapatkan akan dipengaruhi oleh faktor konsentrasi NaCl, komposisi kimia material, dan konsentrasi oksigen terlarut pada larutan NaCl. Urutan hasil ketahanan korosi dari yang paling rendah ke yang paling tinggi adalah 3.5, 4, 5, 2, dan 1. Ketahanan korosi terendah didapatkan pada konsentrasi NaCl 3.5 dimana hampir sama dengan keadaan air laut dengan kelarutan oksigen pada larutan dalam keadaan maksimum.

.....Corrosion behavior of austenitic stainless steels type 304L in various concentrations of aqueous sodium chloride solutions were investigated related to its pitting corrosion resistance. Experimental testing was carried out by using cyclic polarization method at room temperature 27°C to evaluate the corrosion mechanism by considering breakdown potential Ecor and protection potential Ep. Aqueous sodium chloride solutions were prepared with various concentration i.e. 1, 2, 3.5, 4 and 5 w v. The testing results were represented by cyclic potentiodynamic polarization curves for both alloys which showed potentials that indicated the onset of potentials Ecor and Ep respectively.

The results were influenced by sodium chloride concentrations and the chemical composition of alloys. Rank of the values of Ecor and Ep of 304L and 316L at various sodium chloride concentrations from the highest to the lowest were 1, 2, 5, 4, 3.5 w v NaCl consecutively. It was observed that the lowest corrosion resistance of both alloys was at 3.5 w v NaCl which was similar to typical seawater solution with maximum dissolved oxygen solubility.