Ketahanan Korosi Super Austentic Stainless Steel, Duplex 2205 dan 316 dalam Lingkungan Asam Sulfamat dengan Variasi Konsentrasi dan Temperatur = Corrosion Resistance of Super Austenitic Stainless Steel, Duplex 2205 dan 316L in Sulfamic Acid Environment with Variation of Concentration and Temperature

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Abstrak

Saat ini, asam sulfamat sebagai bahan industri kimia utama ada di mana-mana. Karena sifatnya yang korosif, maka perlu menggunakan wadah khususnya fungsi penukar panas yang sesuai untuk menghindari kontaminasi larutan. Perilaku korosi baja tahan karat super austenitik, duplex 2205, dan 316L yang terpapar asam sulfamat diteliti dengan menggunakan Metode Kehilangan Berat, Polarisasi dan EIS. Dalam pengujian kehilangan berat, diberikan variasi konsentrasi dan temperatur selama 1 sampai 5 hari paparan. Sedangkan metode pengujian dengan Polarisasi dan EIS dilakukan pada temperature 25°C dengan variasi konsentrasi. Untuk mendukung hasil pengujian korosi, dilakukan karakterisasi pada sampel uji maupun larutannya menggunakan XRD, AAS dan OES. Sedangkan pengamatan visualisasi permukaan produk korosi dilakukan dengan Mikroskop Optik dan SEM-EDS. Hasil penelitian menunjukkan bahwa laju korosi material cenderung meningkat dengan meningkatnya konsentrasi asam sulfamat dan menurun ketika mendekati konsentrasi 80% berat. Baja tahan karat super austenitik memiliki laju dan arus korosi paling kecil serta impedansi yang paling besar daripada duplex 2205 dan 316L. Kesimpulan menunjukkan bahwa material super austenitic stainless steel sangat cocok digunakan di lingkungan asam sulfamat dengan berbagai variasi konsetrasi dan temperatur.

.....Currently, sulfamic acid as the main chemical industrial ingredient is ubiquitous. Due to its corrosive nature, it is necessary to use a container especially a suitable heat exchanger function to avoid contamination of the solution. The corrosion behavior of super austenitic, duplex 2205, and 316L stainless steels exposed to sulfamic acid was investigated using the Weight Loss Method, Polarization and EIS. In the weight loss test, various concentrations and temperatures for 1 until 5 days of exposure. While the testing method with Polarization and EIS was carried out at a temperature of 25°C with various concentrations. To support corrosion test results, characterization of the sample and solution was carried out using XRD, AAS and OES. Meanwhile the observation of the surface visualization of corrosion products was carried out with an Optical Microscope and SEM-EDS. The results showed that the corrosion rate of the material tends to increase with increasing concentration of sulfamic acid and decrease when approaching a concentration of 80% by weight. Super austenitic stainless steel has the lowest corrosion rate and current and the highest impedance than duplex 2205 and 316L. The surface morphological characteristics of corrosion products are different for the three materials. In 316L, show pattern intergranular corrosion and selective dissolution patterns are seen at duplex 2205, while at SASS there is no corrosion pattern. The conclusion shows that the super austenitic stainless steel material is very suitable for use in a sulfamic acid environment in various concentrations and temperature.