Studi aplikasi ekstrak daun alang-alang (imperata cylindrica) sebagai inhibitor korosi pada baja karbon dalam larutan HCL dan brine = Study aplication of extract leaves reeds (imperata cylindrica) as corrosion inhibitor on carbon steel plate in a solution of HCL and brine

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Abstrak

Kebutuhan akan minyak bumi mentah semakin meningkat dalam pangsa pasar nasional maupun Internasional. Berbagai upaya terus dilakukan guna meningkatkan kualitas minyak mentah, salah satunya melalui proses pendistribusian minyak mentah. Pendistribusian yang dinilai efisien yaitu dengan menggunakan pipa bawah laut ataupun bawah tanah yang terbuat dari material baja karbon. Sehingga sangat penting bagi industri minyak berfokus pada pemeliharaan alat dan konstruksi pipa terutama bahan material baja dari potensi terkena korosi.

Salah satu upaya dalam mencegah korosi yaitu penambahan inhibitor korosi dengan konsentrasi kecil (ppm) ke dalam media pengkorosif guna mengendalikan korosi pada material logam. Inhibitor korosi dari senyawa bahan alam mempunyai banyak keunggulan yaitu ramah lingkungan, mudah didapatkan, dan mudah diproduksi.

Pada penelitian ini dilakukan seleksi inhibitor korosi terbaik dari tiga fraksi yaitu fraksi n-heksana, fraksi etil asetat, dan fraksi metanol dari ekstrak daun alang-alang berdasarkan metode Weight Loss. Karakterisasi lapisan yang terbentuk pada permukaan baja karbon diamati dengan FT-IR, UV-Vis DRS, XRD dan bentuk morfologi permukaan plat baja karbon berdasarkan SEM EDS.

Keberhasilan inhibitor korosi dalam melindungi baja karbon terlihat dari persen efisiensi inhibitor yaitu 94.89% pada konsentrasi 600 ppm suhu 30oC dalam larutan pengkorosif HCl 0.5M. Adsorpsi inhibitor korosi FH secara isoterm mengikuti isoterm adsorpsi Langmuir. Aplikasi inhibitor korosi FH dengan konentrasi 600 ppm pada suhu 60oC dengan waktu kontak 36 jam memberikan % efisiensi inhibitor di atas 90% pada larutan brine sintesis.

.....Demand for crude oil has increased in market share both national and international. There are continuous efforts to improve the quality of crude oil, one of them through the process of distribution of crude oil. The distribution is considered efficient by using underwater or underground pipelines which are made of carbon steel material. So it is very important to the oil industry focusing on equipment maintenance and pipeline construction materials, especially steel of potential for corrosion.

One effort in preventing corrosion is the addition of a corrosion inhibitor with a small concentration (ppm) to the corrosive agent media to control corrosion on metallic materials. Corrosion inhibitors from natural materials compounds have many advantages that are environmentally friendly, readily available, and easily manufactured.

In this study, corrosion inhibitor selected the best of the three fractions, there are n-hexane fraction, ethyl acetate fraction, and methanol fraction from extract of leaves reeds based of Weight Loss method. Characterization layer formed on the surface of carbon steel was observed by FT-IR, UV-Vis DRS, XRD and the morphology of the surface of carbon steel plate by SEM EDS.

The success of corrosion inhibitors to protect carbon steel look of a percent efficiency inhibitor that is

94.89% at a concentration of 600 ppm temperature 30°C in a HCl corrosive agent solution of 0.5 M. FH corrosion inhibitor adsorption isotherm is followed Langmuir adsorption isotherm. FH corrosion inhibitor application with concentration 600 ppm at temperature 60°C with a contact time of 36 hours gave % inhibitor efficiency above 90% in the brine solution synthesis.