

Studi Ekstrak Daun Beluntas (*Pluchea Indica* Less.) Sebagai Inhibitor Korosi Ramah Lingkungan Terhadap Baja Karbon Rendah di Lingkungan 3,5 % NaCl = Study of Beluntas (*Pluchea Indica* Less.) Leaves Extracts as Green Corrosion Inhibitor on Low Carbon Steel in 3.5 % NaCl

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Abstrak

ABSTRAK

Penelitian ini dilakukan untuk menganalisa pengaruh inhibisi ekstrak cair daun Beluntas (*Pluchea Indica* Less.) terhadap korosi pada baja karbon rendah di lingkungan 3,5% NaCl. Penelitian dilakukan menggunakan pengujian weight loss, polarisasi, dan Fourier transform infrared spectroscopy (FTIR). Pengujian weight loss menunjukkan bahwa perendaman selama 9 hari dengan penambahan ekstrak sebanyak 3 mL memberikan nilai rata-rata efisiensi paling maksimum sebesar 75,97% dengan rata-rata laju korosi paling minimum sebesar 0,89 mpy. Pengujian polarisasi menunjukkan terjadi pergeseran kurva ke arah anodik pada penambahan ekstrak sebanyak 1,2,3 mL, dan bergeser ke arah katodik pada penambahan sebanyak 4 mL. Penambahan ekstrak berpengaruh terhadap penurunan laju korosi yaitu dari 24,8 $\mu\text{A.cm}^{-2}$ menjadi 5,04 $\mu\text{A.cm}^{-2}$, sehingga memperkuat hasil

pengujian weight loss bahwa ekstrak daun Beluntas dapat menghambat korosi baja karbon rendah di larutan 3,5% NaCl. Pengujian polarisasi menunjukkan bahwa ekstrak daun Beluntas memiliki tipe inhibisi campuran (mixed) dengan kecenderungan lebih dominan ke arah anodik berdasarkan nilai potensial korosi yang berubah secara acak. Pengujian FTIR menunjukkan bahwa ekstrak daun Beluntas teradsorpsi pada permukaan baja karbon rendah dan proses adsorpsinya terjadi melalui gugus fungsi yang dimiliki ekstrak. Mekanisme adsorpsi ekstrak daun Beluntas sesuai dengan Langmuir adsorption isotherm yang menunjukkan bahwa telah terjadi pembentukan lapisan monolayer di permukaan baja karbon rendah.

ABSTRACT

The study was conducted to analyze the inhibition effect of Beluntas (*Pluchea indica* Less.) leaves extract on the corrosion of low carbon steel in 3.5% NaCl environment. The study was investigated by weight loss, polarization, and Fourier transform infrared spectroscopy (FTIR) methods. Weight loss showed that soaking for 9 days with the addition of 3 mL of the extract gave an average value of the maximum efficiency of 75.97% with an average of the minimum corrosion rate of 0.89 mpy. Polarization shows the polarization curve shifts to the anodic direction

in addition of 1,2,3 mL extract, and shifted toward the cathodic curve to the addition of 4 mL. The presence of inhibitor causes decrease in the corrosion rate from 24.8 to 5.04 $\text{mA}\cdot\text{cm}^{-2}$, thus confirm the results of weight loss that Beluntas leaves extract can inhibit the corrosion of low carbon steel in 3.5% NaCl solution . The polarization showed that the Beluntas leaves extract acts through mixed mode of inhibition, as evident from the values of E_{corr} , which do not increase or decrease in a regular manner from the blank value. FTIR showed that the Beluntas leaves extract adsorbed on the surface of low carbon steel and the process of adsorption occurs through a functional group extract. Beluntas leaves extract shows Langmuir adsorptions isotherm that indicated the monolayer formation on the low carbon steel surface.