Studi ekstrak kulit kentang (Solanum tuberosum L.) sebagai green corrosion inhibitor pada baja karbon rendah di lingkungan 3,5% NaCl = Study of potato peel (Solanum tuberosum L.) extract as green corrosion inhibitor on low carbon steel in 3,5% NaCl environment

Firman Ady Nugroho, author

Abstrak

Ekstrak kulit kentang diteliti sebagai inhibitor korosi ramah lingkungan pada baja karbon di lingkungan 3,5% NaCl menggunakan uji kehilangan berat, polarisasi, dan Fourier transform infrared spectroscopy. Pada pengujian kehilangan berat menunjukkan konsentrasi 6mL memberikan nilai efisiensi paling optimal sebesar 73,33 % dengan laju korosi paling rendah sebesar 1,59 mpy.
Pada pengujian polarisasi terjadi penurunan rapat arus korosi sebesar 9.79 µA/cm2 menjadi 3.27 µA/cm2, sehingga memperkuat hasil uji kehilangan berat bahwa ekstrak kulit kentang dapat menghambat korosi baja karbon rendah pada lingkungan 3,5% NaCl. Penambahan ekstrak kulit kentang menyebabkan pergeseran potensial korosi (Ecorr) mengarah kearah anodik dengan tipe inhibisi campuran (mixed).
Pengujian FTIR menunjukkan ekstrak kulit kentang teradsorpsi pada permukaan baja karbon rendah melalui gugus fungsi yang dimiliki ekstrak. Mekanisme adsorpsi ekstrak kulit kentang mengikuti Langmuir adsorption isotherm yang mengindikasikan terbentuknya lapisan monolayer pada permukaan baja karbon rendah.
<hr>Potato peel extract as green corrosion inhibitor on low carbon steel in 3.5% NaCl environment has been investigated using weight loss, polarization, and fourier transform infrared spectroscopy. The result of weight loss that showed that optimum inhibition is 73,33% in 6 mL concentration with corrosion rate 1,59 mpy and 9 days of immersion time.
Polarization show that decrease in current density 9.79 to 3.27 µA/cm2, with the result that confirm the results of weight loss that potato peel extract inhibit corrosion low carbon steel on 3.5% NaCl environment. Additional of potato peel extract showed displacement of potential corrosion to anodic direction, and act as mixed type inhibition.
FTIR showed that potato peel extract adsorbed to surface of low carbon steel through functional group extract. The mechanism of adsorption followed the Langmuir isothermal adsorption which indicated formation of monolayer film on low carbon steel surface.