

Studi inhibitor korosi berbahan dasar triazine dalam larutan natrium klorida 3,5% dengan menggunakan metode adsorpsi = Study of triazine based corrosion inhibitor in 3,5% sodium chloride solution using adsorption model

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Abstrak

Mekanisme inhibisi korosi dari inhibitor berbahan dasar triazine pada baja API 5L Grade X60 di lingkungan NaCl 3,5% diinvestigasi dengan menggunakan metode model adsorpsi yang didapat dari hasil pengujian Tafel Polarisasi, Linier Polarisasi dan Electrochemical Impedance Spectroscopy (EIS) dengan menggunakan variasi konsentrasi 0 ppm, 50 ppm, 100 ppm, 150 ppm, 200 ppm dan 250 ppm. Senyawa triazine yang teradsorpsi pada permukaan logam diinvestigasi dengan menggunakan pengujian Fourier Transform InfraRed (FTIR). Hasilnya didapatkan bahwa proses adsorpsi inhibitor triazine terjadi secara spontan mengikuti mode adsorpsi Langmuir isoterm. Berdasarkan nilai Nilai Goads berada pada rentang -11.0697 kJ/mol sampai -19.7833 kJ/mol menunjukkan bahwa inhibitor triazine menghambat korosi dengan cara adsorpsi fisika (interaksi elektrostatis antara muatan molekul inhibitor dengan muatan permukaan logam) membentuk lapisan tunggal di permukaan logam sehingga dapat menghambat proses korosi. Besarnya efisiensi inhibisi inhibitor berbahan dasar triazine bergantung pada konsentrasi inhibitor. Efisiensi inhibisi tertinggi diperoleh pada konsentrasi triazine 150 ppm sebesar 68,674% berdasarkan hasil pengujian Electrochemical Impedance Spectroscopy.

.....Corrosion inhibition mechanism of triazine-based corrosion inhibitor on API 5L Grade X60 steel in 3.5% NaCl environment was investigated by using adsorption method from the results of tafel polarization, linier polarization resistance (LPR), and Electrochemical Impedance Spectroscopy (EIS) tests with 0 ppm, 50 ppm, 100 ppm, 150 ppm, 200 ppm and 150 ppm concentration variation. Triazine compounds which adsorbed on metal surface was also investigated by Fourier Transform InfraRed (FTIR) test. It was found that adsorption process of triazine-based inhibitor occurs spontaneously and follow the Langmuir adsorption isotherm. From the calculation of Goads (around -11.0697 kJ/mol to -19.7833 kJ/mol), it indicates that the inhibitor inhibited corrosion by physisorption (involving electrostatic attraction between the charged of inhibitor molecules and the charged of metal surface) to form a monolayer on the metal surface so that corrosion will be obstructed. Inhibition efficiency of triazine-based inhibitor was concentration dependent. The optimum inhibition efficiency is 68,674% in 150 ppm concentration of triazine as a result of Electrochemical Impedance Spectroscopy test.