

## ABSTRAK

Penelitian ini bertujuan untuk menganalisa potensi N,N-bis-(2-hidroksietil) oleamida, (NHEO) sebagai inhibitor korosi baja karbon API L5 X65 dalam medium  $H_2SO_4$  0,5 M. Sampel NHEO yang digunakan diperoleh melalui hasil reaksi amidasi asam oleat dan dietanolamina menggunakan bantuan katalis asam fosfat pada suhu  $90 \pm 5^\circ C$ . Proses pemurnian tidak dilakukan sehingga sampel diuji bersama-sama dengan matriksnya. Pengujian dilakukan menggunakan metode kehilangan berat. Hasil yang didapat menunjukkan bahwa NHEO memiliki potensi yang cukup baik sebagai inhibitor korosi baja karbon API L5 X65, dengan nilai efisiensi inhibisi maksimum 73,28% pada penambahan sampel 800 ppm dan waktu paparan 2 hari. Efisiensi inhibisi menurun seiring berkurangnya konsentrasi NHEO dan bertambahnya waktu paparan. Proses NHEO dalam menghambat korosi diduga melalui adsorpsi molekul-molekulnya pada permukaan logam membentuk suatu lapisan protektif yang adsorpsinya mengikuti model isotherm Langmuir. Adapun jenis adsorpsinya berupa fisisorpsi berdasarkan perhitungan harga  $\Delta G_{ads}^\circ$ .

**Kata Kunci:** N,N-bis-(2-hidroksietil) oleamida; Baja karbon; Korosi asam; Inhibitor korosi

### **ABSTRACT**

*The study was aimed to analyze the potency of N,N-bis-(2-hydroxyethyl) oleamide, (NHEO) as corrosion inhibitor of API L5 X65 carbon steel in 0,5 M H<sub>2</sub>SO<sub>4</sub> medium. The NHEO sample used in this study was obtained from synthesizing oleic acid and diethanolamine through amidation reaction using phosphoric acid as catalyst at 90±5 °C. Purification process was not conducted, thus the sample was analyzed along with its matrix. The study was conducted using weight loss measurement technique. The result obtained shows that NHEO act as a fairly good corrosion inhibitor for API L5 X65 carbon steel, having maximum inhibition efficiency of 73,28% at concentration of 800 ppm and 2 days of exposure time. The inhibition efficiency decreased with decrease in NHEO concentration and increase in exposure time. The process of NHEO in inhibiting corrosion is suspected through adsorption of NHEO molecules at the metal surface, resulting in formation of protective film which is found to accord with Langmuir adsorption isotherm model. The Inhibitor adsorbed on the metal surface by physisorption according to  $\Delta G_{ads}^{\circ}$  value.*

**Key Words:** *N,N-bis-(2-hydroxyethyl) oleamide; Carbon Steel; Acid corrosion; Corrosion inhibitor*