ABSTRAK
SINTESIS GLISEROL STEARAT DARI GLISEROL PRODUK INDUSTRI MINYAK KELAPA SAWIT UNTUK PROSES INHIBITOR KOROSI

(Ariyanto Hadi wijaya; 57 Halaman, 10 Tabel, 12 Gambar, 4 Lampiran)

Penelitian ini bertujuan untuk mensintesis gliserol stearat dari produk industri minyak kelapa sawit, serta menguji efektivitasnya sebagai inhibitor korosi pada logam aluminium. Gliserol direaksikan dengan asam stearat menggunakan katalis asam sulfat melalui proses esterifikasi pada suhu 120°C dengan variasi waktu reaksi 120–220 menit. Produk hasil sintesis dikarakterisasi menggunakan metode Kromatografi Lapis Tipis (KLT) dan Gas Chromatography-Mass Spectrometry (GC-MS). Uji efektivitas inhibitor dilakukan menggunakan metode gravimetri berdasarkan standar ASTM G31-21 pada larutan HCl 1 M. Hasil penelitian menunjukkan bahwa waktu reaksi optimum diperoleh pada 180 menit dengan %yield gliserol monostearat sebesar 16,36%. Uji KLT menunjukkan nilai Rf tertinggi mendekati standar gliserol monostearat, dan hasil GC-MS mengidentifikasi senyawa utama berupa gliserol monopalmitat dan gliserol monostearat. Pengujian efektivitas inhibitor menunjukkan bahwa metode pelapisan permukaan menghasilkan efisiensi penghambatan korosi rata-rata sebesar 76,89%, lebih tinggi dibandingkan metode pencampuran langsung sebesar 73,69%. Dengan demikian, gliserol stearat memiliki potensi sebagai inhibitor korosi ramah lingkungan yang efektif dari limbah biodiesel.

Kata kunci: gliserol stearat, esterifikasi, produk samping biodiesel, inhibitor korosi, KLT, GC-MS, metode gravimetri.

ABSTRACT

SYNTHESIS OF STEARATE GLYCEROL FROM GLYCEROL INDUSTRY PRODUCTS OF PALM OIL FOR CORROSION INHIBITOR

*(*Ariyanto Hadi Wijaya*; 57 Pages,10 Tables,12 Figures, 4 Appendices)*

This research aims to synthesize glyceryl stearate from glycerol industry product of palm oil and evaluate its effectiveness as a corrosion inhibitor on aluminum metal. Glycerol was reacted with stearic acid using sulfuric acid as a catalyst through an esterification process at 120°C, with reaction times varying from 120 to 220 minutes. The synthesized product was characterized using Thin Layer Chromatography (TLC) and Gas Chromatography-Mass Spectrometry (GC-MS). The corrosion inhibition efficiency was tested using the gravimetric method according to the ASTM G31-21 standard in 1 M HCl solution. The results showed that the optimum reaction time was 180 minutes, with a yield of pure glyceryl monostearate of 16.36%. TLC results indicated the highest Rf value was close to the glyceryl monostearate standard, and GC-MS identified the main compounds as glyceryl monopalmitate and glyceryl monostearate. The corrosion inhibition tests revealed that the surface coating method produced an average inhibition efficiency of 76.89%, which was higher than the 73.69% obtained using the direct mixing method. Therefore, glyceryl stearate demonstrates potential as an effective and environmentally friendly corrosion inhibitor derived from biodiesel waste.

Keywords: *glyceryl stearate, esterification, biodiesel by-product, corrosion inhibitor, TLC, GC-MS, gravimetric method.*