

ABSTRAK

**PENGARUH RASIO MINYAK JELANTAH DAN GLISEROL SERTA
KONSENTRASI *MALEIC ANHYDRIDE* TERHADAP KARAKTERISTIK
RESIN ALKID DAN APLIKASINYA SEBAGAI CAT MINYAK ANTI
KOROSI**

(Saddam Husein Valentino, 2026, 56 Halaman, Tabel 12, Gambar 17, 4 Lampiran)

Minyak jelantah merupakan limbah yang berpotensi dimanfaatkan sebagai bahan baku pembuatan resin alkid. Penelitian ini bertujuan untuk menganalisis pengaruh rasio minyak jelantah dan gliserol serta konsentrasi *Maleic anhydride* terhadap karakteristik resin alkid dan aplikasinya sebagai cat minyak anti korosi. Sintesis resin alkid dilakukan melalui proses alkoholisis dan polikondensasi dengan variasi rasio minyak jelantah dan gliserol (1:1; 1:1,5; 1:2; 1:2,5; dan 1:3) serta konsentrasi *Maleic anhydride* (10%, 15%, 20%, 25%, dan 30%). Karakterisasi resin meliputi pengujian viskositas, bilangan asam, dan FTIR. Hasil penelitian menunjukkan bahwa peningkatan rasio gliserol meningkatkan viskositas dan menurunkan bilangan asam resin alkid. Nilai viskositas yang diperoleh berkisar antara 1038–1983 cP dan bilangan asam 8,6–18,7 mg KOH/g. Analisis FTIR menunjukkan terbentuknya gugus fungsi khas resin alkid berupa O–H, C–H alifatik, C=O ester, dan C–O ester. Kondisi optimum diperoleh pada rasio minyak jelantah dan gliserol 1:3 dengan konsentrasi *Maleic anhydride* 20% (S23), menghasilkan viskositas 1764 cP dan bilangan asam 8,6 mg KOH/g. Resin alkid yang dihasilkan berhasil diaplikasikan sebagai binder cat minyak anti korosi dan mampu melindungi permukaan logam dari korosi selama 7 hari perendaman dalam larutan NaCl 15%.

Kata Kunci: Minyak jelantah, resin alkid, *Maleic anhydride*, cat anti korosi, polikondensasi

ABSTRACT

THE EFFECT OF THE RATIO OF WASTE-USED OIL AND GLYCEROL AND THE CONCENTRATION OF MALEIC ANHYDRIDE ON THE CHARACTERISTICS OF ALKYD RESIN AND ITS APPLICATION AS ANTI- CORROSION OIL PAINT

(Saddam Husein Valentino, 2026, 56 Pages, 12 Tables, 17 Figures, 4 Appendices)

Waste cooking oil is a waste material that has the potential to be utilized as a raw material for alkyd resin synthesis. This study aimed to analyze the effect of waste cooking oil-to-glycerol ratio and *Maleic anhydride* concentration on the characteristics of alkyd resin and its application as an anti-corrosion oil paint binder. Alkyd resin was synthesized through alcoholysis and polycondensation processes using waste cooking oil-to-glycerol ratios of 1:1, 1:1.5, 1:2, 1:2.5, and 1:3, with *Maleic anhydride* concentrations of 10%, 15%, 20%, 25%, and 30%. Resin characterization included viscosity, acid value, and *Fourier Transform Infrared Spectroscopy* (FTIR) analyses. The results showed that increasing the glycerol ratio increased the viscosity and decreased the acid value of the alkyd resin. The viscosity values ranged from 1038 to 1983 cP, while the acid values ranged from 8.6 to 18.7 mg KOH/g. FTIR analysis confirmed the presence of characteristic functional groups of alkyd resin, including O–H, aliphatic C–H, ester C=O, and ester C–O. The optimum condition was obtained at a waste cooking oil-to-glycerol ratio of 1:3 with 20% *Maleic anhydride* (Sample S23), producing a viscosity of 1764 cP and an acid value of 8.6 mg KOH/g. The synthesized alkyd resin was successfully applied as an anti-corrosion oil paint binder and was able to protect the metal surface from corrosion during 7 days of immersion in a 15% NaCl solution.

Keywords: Waste cooking oil, alkyd resin, *Maleic anhydride*, anti-corrosion paint, polycondensation