

ABSTRACT

OPTIMIZATION OF *MALACHITE GREEN* SEPARATION USING POLY-BISPHENOL A DIGLYCIDYL ETHER (POLY-BADGE) 4:1 AS A *CARRIER* BASED ON POLYMER INCLUSION MEMBRANE

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Malachite green (MG) is a cationic synthetic dye widely used in the textile industry; however, it has the potential to contaminate the environment due to its toxic nature and resistance to natural degradation. This study aimed to optimize the separation of MG using a Polymer Inclusion Membrane (PIM) with Poly-Bisphenol A Diglycidyl Ether (Poly-BADGE) 4:1 as the carrier. The membrane was prepared using the solvent-casting method, with polyvinyl chloride (PVC) as the base polymer, dibenzyl ether (DBE) as the plasticizer, and tetrahydrofuran (THF) as the solvent. Membrane characterization was performed using Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM). The parameters optimized included the source phase pH, HNO₃ concentration in the receiving phase, membrane thickness, carrier concentration, transport time, and a competition study involving Cu(II) and Pb(II) ions in a synthetic wastewater matrix. The results demonstrated that Poly-BADGE 4:1 was an effective carrier in the PIM system, achieving an MG separation efficiency of 90.67%. The optimum conditions were obtained at pH 7, an HNO₃ concentration of 0.75 M, membrane thickness T₅₄, a carrier concentration of 0.07 M, and an optimum transport time of 9 hours. The competition study using synthetic wastewater containing Cu(II) and Pb(II) ions showed a decrease in transport efficiency; however, the membrane remained selective toward MG. FTIR analysis indicated no significant changes in the main functional groups before and after transport, while SEM observations revealed that the membrane surface became rougher after transport, possibly due to the leaching of membrane components.

Keywords: Malachite green, PIM membrane, Poly-BADGE 4:1

**OPTIMASI PEMISAHAN *MALACHITE GREEN* MENGGUNAKAN POLI
BISFENOL A DIGLISIDIL ETER (POLI-BADGE) 4:1 SEBAGAI
CARRIER BERBASIS *POLYMER INCLUSION MEMBRANE***

Oleh

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Skripsi

Sebagai Salah Satu Syarat untuk Mencapai Gelar
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**FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS LAMPUNG
BANDAR LAMPUNG
2026**