

ABSTRAK

TRANSPOR *MALACHITE GREEN* MELALUI *POLYMER INCLUSION MEMBRANE (PIM)* MENGGUNAKAN *CARRIER COPOLY-EUGENOL DIALILFTALAT (Co-EDAF) 4%*

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Malachite green termasuk salah satu bahan pewarna yang digunakan dalam industri tekstil, namun limbahnya dapat mencemari lingkungan dan berpotensi berbahaya bagi kesehatan manusia dan ekosistem sehingga perlu adanya pemisahan *malachite green* dari limbah industri. Penelitian ini membahas mengenai transpor *malachite green* menggunakan metode PIM dengan *copoly-eugenol dialilftalat (Co-EDAF) 4%* sebagai *carrier*. Penelitian ini bertujuan untuk mendapatkan hasil yang optimum dalam proses pemisahan *malachite green*, mengetahui morfologi dan struktur kimia dari membran PIM, serta mengetahui pengaruh logam berat Pb(II) dan Cu(II) terhadap efisiensi pemisahan *malachite green* pada limbah buatan. Membran dipreparasi dengan melarutkan *carrier Co-EDAF 4%*, polivinil klorida (PVC), dan dibenzileter (DBE) ke dalam pelarut tetrahidrofuran (THF). Konsentrasi *malachite green* setelah transpor diukur menggunakan spektrofotometer UV-Vis pada panjang gelombang maksimum 617 nm. Membran PIM sebelum dan setelah transpor dikarakterisasi menggunakan FT-IR dan SEM. Hasil penelitian ini menunjukkan bahwa membran PIM dengan *carrier Co-EDAF 4%* mampu memisahkan *malachite green* secara efektif sebesar 91,12% pada kondisi optimum: pH fasa sumber 7, konsentrasi HNO₃ fasa penerima 1,00 M, ketebalan membran T₅₄, konsentrasi *carrier* 0,08 M, dan waktu transpor 24 jam. Keberadaan logam kompetitor mempengaruhi proses pemisahan *malachite green* dari fasa sumber ke fasa penerima. Hasil pemisahan *malachite green* tanpa kehadiran logam Pb(II) dan Cu(II) menghasilkan konsentrasi *malachite green* lebih besar, yaitu sebesar 91,52% dibandingkan pemisahan *malachite green* dengan adanya logam Pb(II) dan Cu(II), yaitu sebesar 89,92%.

Kata kunci: Co-EDAF 4%, *malachite green*, PIM

ABSTRACT

MALACHITE GREEN TRANSPORT THROUGH POLYMER INCLUSION MEMBRANE (PIM) USING CARRIER COPOLY-EUGENOL DIALILPHTHALATE (Co-EDAF) 4%

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Malachite green is one of the dyes used in the textile industry, but its waste can pollute the environment and potentially be harmful to human health and ecosystems, so it is necessary to separate malachite green from industrial waste. This study discusses the transport of malachite green using the PIM method with 4% copoly-eugenol dialilphthalate (Co-EDAF) as a carrier compound. This study aims to obtain optimal results in the process of separation of malachite green, determine the morphology and chemical structure of the PIM membrane, and the influence of heavy metals Pb(II) and Cu(II) on the efficiency of separation of malachite green in artificial waste. The membrane is prepared by dissolving the Co-EDAF carrier compounds 4%, polyvinyl chloride (PVC), and dibenzileter (DBE) into a tetrahydrofuran (THF) solvent. The concentration of malachite green after transport was measured using a UV-Vis spectrophotometer at a maximum wavelength of 617 nm. The PIM membrane before and after transport was characterized using FT-IR and SEM. The results of this study showed that the PIM membrane with 4% Co-EDAF carrier compounds was able to effectively separate malachite green by 91.12% under optimal conditions: source phase pH 7, HNO₃ receptor phase concentration 1.00 M, T₅₄ membrane thickness, carrier compound concentration 0.08 M, and 24-hour transport time. The presence of competitor metals interferes with the process of separation of green malachite from the source phase to the receiving phase. The result of the separation of malachite green without the presence of Pb(II) and Cu(II) metals resulted in a greater concentration of malachite green, which was 91.52% compared to the separation of malachite green with the presence of Pb(II) and Cu(II) metals, which was 89.92%.

Keywords: Co-EDAF 4%, malachite green, PIM