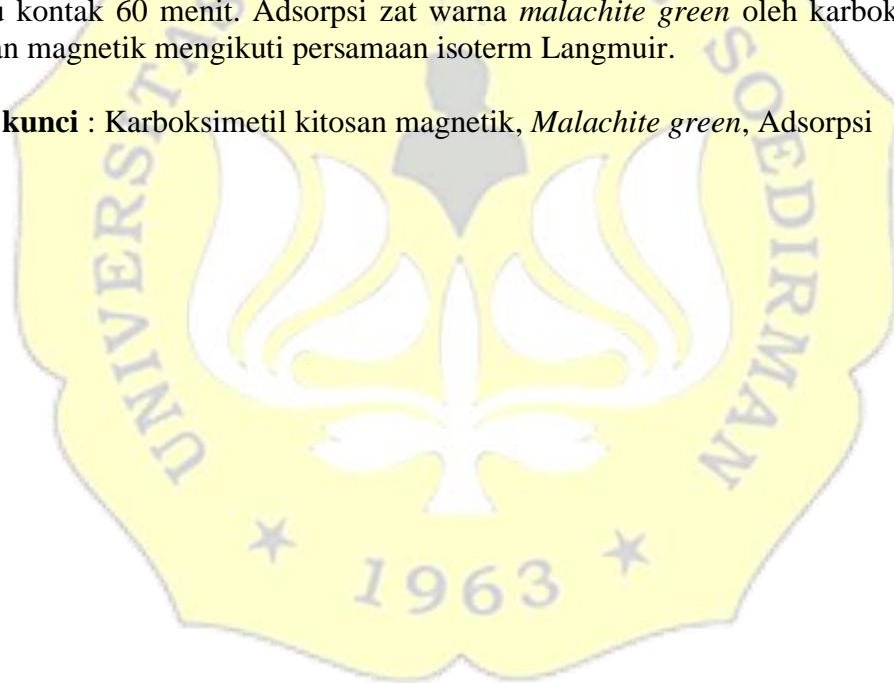


## ABSTRAK

Zat warna *malachite green* banyak dimanfaatkan terutama di industri tekstil. Namun, limbah zat warna *malachite green* berbahaya jika masuk ke perairan. Oleh karena itu, keberadaan zat warna dalam limbah industri harus ditangani secara tepat agar tidak membahayakan lingkungan. Salah satu metode yang dapat digunakan pada proses pengolahan limbah zat warna adalah metode adsorpsi. Tujuan penelitian ini adalah untuk mengetahui sintesis karboksimetil kitosan magnetik sebagai adsorben zat warna *malachite green* serta kapasitas adsorpsinya. Sintesis karboksimetil kitosan magnetik dilakukan dengan menginteraksikan hasil dari sintesis karboksimetil kitosan dengan nanopartikel  $\text{Fe}_3\text{O}_4$ . Penelitian adsorpsi *malachite green* oleh karboksimetil kitosan magnetik dilakukan dengan variasi pH, waktu kontak, dan konsentrasi zat warna. Karboksimetil kitosan magnetik dikarakterisasi menggunakan *Fourier Transform Infrared (FTIR)* dan kemampuan adsorpsinya diuji terhadap zat warna *malachite green* dengan Spektrofotometer UV-Vis. Berdasarkan penelitian diperoleh panjang gelombang maksimum *malachite green* sebesar 617 nm dengan kondisi adsorpsi optimum pada pH 4 dan waktu kontak 60 menit. Adsorpsi zat warna *malachite green* oleh karboksimetil kitosan magnetik mengikuti persamaan isoterm Langmuir.

**Kata kunci :** Karboksimetil kitosan magnetik, *Malachite green*, Adsorpsi



## ABSTRACT

*Malachite green* has been widely used, especially in textile industry. However, the waste water containing *malachite green* dyes is dangerous if it enters the water. Therefore, the presence of dyes in industrial waste must be handled appropriately so it will not endanger the environment. One of some method that can be used in the processing of dyestuff waste is adsorption method. The purpose of this research was to determinate the synthesis of magnetic carboxymethyl chitosan as adsorbent for *malachite green* dyes and their adsorption capacity. Synthesis of magnetic carboxymethyl chitosan was carried out by interacting the results of the synthesis of carboxymethyl chitosan with Fe<sub>3</sub>O<sub>4</sub> nanoparticles. Research on the adsorption of *malachite green* by magnetic carboxymethyl chitosan was carried out with variations in pH, contact time, and dye concentration. Magnetic carboxymethyl chitosan was characterized by Fourier Transform Infrared (FTIR) and tested against *malachite green* adsorption with UV-Vis spectrophotometer. Based on the research, the maximum wavelength of *malachite green* was 617 nm with optimum adsorption conditions at pH 4 and contact time of 60 minutes. The adsorption of *malachite green* dye by magnetic carboxymethyl chitosan followed the Langmuir isotherm equation.

**Keywords :** Magnetic carboxymethyl chitosan, *Malachite green*, Adsorption

