Sintesis dan Karakterisasi Komposit Karbon Green Char-Magnitit (Fe3O4) sebagai Adsorben Methylene Blue dan Rhodamine-B = Synthesis and Characterization of Green Char-Magnetite (Fe3O4) Carbon Composites as Methylene Blue and Rhodamine-B adsorbents

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Abstrak

Industri tekstil menghasilkan air limbah paling banyak, terhitung hampir setengah dari semua limbah pewarna diseluruh dunia. Sumber masalahnya pewarna yang digunakan adalah pewarna sintesis dimana dari senyawa azo sekitar 60-70%. Senyawa azo adalah senyawa organik dengan gugus -N=N- bersifat stabil sehingga sulit untuk degradasi dalam sistem akuatik. Hingga saat ini, adsorpsi dianggap sebagai salah satu teknik yang paling unggul untuk penghilangan zat warna dalam sistem akuatik. Pada penelitian ini, peniliti mensintesis komposit KGC-Fe3O4 sebagai adsorben zat warna Methylene Blue dan Rhodamine B. Hasil sintesis kemudian dikarakterisasi menggunakan beberapa intstrumentasi yaitu, FTIR, XRD, SEM-EDX, dan BET. Hasil sintesis diaplikasikan untuk melihat pH, waktu kontak, konsentrasi adsorbat, dan jumlah adsorben optimum. Selanjutnya, KGC-Fe3O4 diuji reusabilitas dan dilihat perbandingan selektivitasnya terhadap dua zat warna kationik.

.....The textile industry generates the most amount of wastewater, accounting for nearly half of all dye waste worldwide. The source of the problem is the dyes used are synthetic dyes which contain about 60-70% of azo compounds. Azo compounds are organic compounds with -N=N- groups which are stable, making it difficult to degrade in aquatic systems. Until now, adsorption is considered as one of the most superior techniques for dye removal in aquatic systems. In this study, the researchers synthesized the KGC-Fe3O4 composite as an adsorbent for Methylene Blue and Rhodamine B dyes. The results of the synthesis were then characterized using several instruments, namely FTIR, XRD, SEM-EDX, and BET. The synthesis results were applied to see the optimum pH, contact time, adsorbate concentration, and amount of adsorbent. Next, KGC-Fe3O4 was tested for reusability and a comparison of its selectivity was observed for the two cationic dyes.