

Activated Carbon Coated Magnetite Nanoparticles as a Heterogeneous Catalyst for Dye removal

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Abstract. Recent developments in water waste treatment have led to an improvement of the degradation processes of organic pollutants in aqueous medium. The heterogeneous Fenton process is particularly attractive for the removal of poorly biodegradable organic compounds such as the dyes that used in textile industry. In this study, we focused on the preparation of a purified carbon / magnetite composite (CP-Fe₃O₄) by the hydrothermal method using a local and inexpensive charbon. Then, the CP-Fe₃O₄ synthesized material was applied in the removal of Methylene Blue (BM). The textural, structural properties of the CP-Fe₃O₄ composite were characterized using different techniques such as X-ray diffraction (XRD), scanning electron microscopy (SEM). The experimental result shows that the use of the system (CP-Fe₃O₄ / H₂O₂) reached the almost total decolorization of the methylene blue dye. Evaluation of the effect of composite dose, H₂O₂ dose, BM concentration and temperature demonstrated that these parameters affect considerably the decolorization yield of the methylene blue dye. Although, the system has a higher activity, its stability and reuse remain very noteworthy.

Keywords: Composite, Dye, Heterogeneous Fenton, Magnetite