

REUSABLE PHOTOCATALYST MATERIAL BASED ON GLAGAH KULONPROGO BEACH IRON SAND FOR THE DEGRADATION OF METHYL ORANGE AND RHODAMINE B DYES IN TEXTILE WASTEWATER.

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ABSTRACT

The purpose of this study is to examine the use of Fe₃O₄/GO nanocomposites to degrade methyl orange (MO) and rhodamine b (Rh-B) color waste and how it performs after more than once. This research will be carried out for 1 year. The addition of GO can indeed increase the photocatalyst activity quickly. However, the addition of too much GO can make the magnetic properties of the Fe₃O₄/GO composite not dominant. If this happens, it will be difficult to separate the photocatalyst material from the solution so that it cannot be reused. Therefore, the optimization of Fe₃O₄/GO composites is very important for the development of effective and reusable photocatalyst materials to improve environmental quality.

The results show that the large surface area and band gap energy are suitable for MO degradation under UV irradiation. Fe₃O₄/GO achieved a degradation rate toward MO of 99% after 240 min of exposure and could be separated from the final solution using an external magnetic field. Fe₃O₄/GO was also recycled for reuse three times with high degradation efficiency. The best degradation performance of Fe₃O₄ against RhB was achieved with 0.1 gram Fe₃O₄/GO, which degraded RhB by 91% after 270 min of UV irradiation. Reuse of Fe₃O₄/GO was tested three times with effective degradation.

Kata Kunci: *Photocatalyst, Fe₃O₄/GO, methyl orange, rhodamine b, iron sand*