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### Original Research Article

## Photocatalytic degradation of methyl orange dye using bismuth oxide nanoparticles under visible radiation

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#### ABSTRACT

In this study, Bismuth oxide supported by copper nanoparticles were successfully synthesized by hydrothermal method and the effect of pH, catalyst dose of initial dye concentration was studied. It has shown excellent photocatalytic performance in the degradation of methyl orange dye under UV light, so that 93.76% degradation was obtained at acidic pH and color concentration of 20 mg/l with 0.04 g/l photocatalyst. The kinetic study reacted that the Pseudo-first-order model is the best model for the photocatalytic degradation of methyl orange. In addition, the reuse test showed that the nanocomposite, after 4 reuse periods maintained its stability in high colour removal. Therefore, it can be safely said that the nanocomposite due to its good photocatalytic performance can be used as a promising photocatalyst for the treatment of environmental pollutants on a large scale.

**Keywords:** Methyl orange, Hydrothermal center, Photocatalytic degradation, Reuse.