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Ag doped ZnO/CdS photocatalyst degradation on dyes

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**Ag DOPED ZnO/CdS PHOTOCATALYST DEGRADATION ON
DYES**

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ABSTRACT

Ag Doped ZnO/CdS Photocatalyst Degradation on Dyes

This study focuses on the development of an Ag-doped ZnO/CdS photocatalyst for the removal of harmful dyes such as Methylene Blue (MB) and Reactive Red 4 (RR4) from wastewater. The photocatalyst was synthesized using a hydrothermal method and characterized through FTIR, XRD, UV-Vis/DRS, and PL analysis. Silver (Ag) doping was introduced to enhance visible light absorption and reduce the recombination rate of electron-hole pairs. The results showed that the band gap of the photocatalyst was reduced to approximately 2.79 eV, improving its light absorption capability. The Ag-ZnO/CdS photocatalyst demonstrated the highest degradation efficiency, achieving up to 80% dye removal within 60 minutes. Recyclability tests also confirmed the material's ability to be reused up to five cycles without significant loss in performance. Overall, this study confirms that Ag-ZnO/CdS is an effective and promising photocatalyst for practical wastewater treatment applications.

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