

**DEVELOPMENT OF Ag₂O/ZnO COMPOSITE
PHOTOCATALYST FOR METHYL ORANGE
DEGRADATION**

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ABSTRACT

Environmental pollution is contamination of the Biological, Physical and the Chemical components of the Land, Water and Air. It can cause harm or discomfort to the humans or other living organisms in the environment. Dyes may adversely affect the aquatic life because of the presence of aromatic materials, metals and chlorides. Therefore, for water treatment processes, dye removal is important. This study is focused on development of a composite material to remove organic pollutants in waste water. Model pollutant used in this study is Methyl Orange (MO) and composite is $\text{Ag}_2\text{O}/\text{ZnO}$. Then the capacity of $\text{Ag}_2\text{O}/\text{ZnO}$ to act as a photocatalyst to degraded organic dyes was evaluated and find optimum conditions/ composition of the composite. Results indicate the composite material can successfully degrade MO under visible light. The highest degradation rate which 74% was observed for the optimum composition of $\text{Ag}_2\text{O}:\text{ZnO}$ ratio 3:5.

To find the concentration of the unknown solution used an equation known Beer's law, $A = \epsilon l c$, Where A is absorbance, ϵ is the molar absorptivity, l is the path length and c is concentration of the solution. The degradation efficiency is calculated by $\text{Degradation}\% = (A - A_0) / A_0 * 100$ Where A_0 represents the initial absorbance, A represents the reaction absorbance of the MO at the characteristic absorption wavelength of 465 nm. Freundlich adsorption isotherm is used, $x/m = kp^{1/n}$ or $\log x/m = \log k + 1/n \log P$ Where x is the mass of the gas adsorbed on mass m of the adsorbent at pressure p and k, n are constants whose values depend upon adsorbent and gas at particular temperature.