PREPARATION OF SILVER PHOSPHATE/GRAPHITIC CARBON NITRIDE VIA MICROWAVE IRRADIATION FOR PHOTODEGRADATION OF RHODAMINE B

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ABSTRACT

PREPARATION OF SILVER PHOSPHATE/GRAPHITIC CARBON NITRIDE VIA MICROWAVE IRRADIATION FOR PHOTODEGRADATION OF RHODAMINE B

Poor treatment of dyed wastewater could lead to serious water pollution and health problems. Photocatalysis is a high-impact method of reducing present environmental pollution on a big scale. Graphite phase carbon nitride g-C_3N_4 is a nonmetallic semiconductor photocatalyst that give significant advantages over other metal photocatalysts. However, there are limitations of g-C_3N_4 causing the photocatalytic activity slower. This issue can be overcome by coupling with silver phosphate. Research has been done on the synthesis of Silver Phosphate/graphitic Carbon Nitride (Ag_3PO_4/g-C_3N_4)using the microwave irradiation method, Ag_3PO_4/g-C_3N_4 material was applied as a photocatalyst to degrade Rhodamine B dye. Composite Ag_3PO_4/g-C_3N_4 synthesis was made by mixing Ag_3PO_4 and g-C_3N_4 in distilled water, which was then dried, then place in a microwave for 30 minutes at 450W. The results of the Ag_3PO_4/g-C_3N_4 synthesis were characterized using several instruments, including XRD FESEM, FTIR, and UV-Vis. The photocatalytic activity of the catalyst was observed in the degradation of Rhodamine B for 60 minutes using a 0.375 g/L catalyst. 10 CNAP shows the highest rate (95%) >5CNAP (82%)>Ag_3PO_4 (68%)>15CNAP (54%) > g-C_3N_4 (50%). Photocatalytic activity test using RhB was obtained that pH 6 as the optimum pH with a % degradation of 95%, obtained a concentration of 10 ppm as the optimum concentration with a % degradation of 95%, and obtained 0.5 g/L catalyst give the best performance degradation, 98%. For the scavenger, adding methanol to RhB, gives the highest percentage (93%). It shows that photogenerated H^+ is crucial which decides this catalyst mechanism: Type II Heterojunction.