

**THE EFFECT OF METAL LOADING ON PHOTOCATALYTIC ACTIVITY  
OF GRAPHITIC CARBON NITRIDE FOR PHOTOREDUCTION  
OF HEXAVALENT CHROMIUM**

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This Final Year Project Report entitled “**The Effect of Metal Loading on Photocatalytic Activity of Graphitic Carbon Nitride for Photoreduction of Hexavalent Chromium**” was submitted by Nur Faatihah Binti Ahmad Redzuan in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry with Management, in the Faculty of Applied Sciences, and was approved by

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## ABSTRACT

### THE EFFECT OF METAL LOADING ON PHOTOCATALYTIC ACTIVITY OF GRAPHITIC CARBON NITRIDE FOR PHOTOREDUCTION OF HEXAVALENT CHROMIUM

Hexavalent chromium Cr(VI) is toxic waste that lead to water pollution and give a negative impact on health and environment. The photocatalytic reduction is effective method to reduce Cr(VI) to harmless toxic. Graphitic carbon nitride (g-C<sub>3</sub>N<sub>4</sub>) as semiconductor photocatalysts shows a great potential for reduction of Cr(VI) such as visible light driven and excellent stability of physicochemical. However, g-C<sub>3</sub>N<sub>4</sub> is modified with metal to enhance the performance of photoreduction of Cr(VI). In this study, the effect of different metal of Ag, Cu and Ni loaded on g-C<sub>3</sub>N<sub>4</sub> were synthesized by using impregnation method. The physical and chemical properties of Ag, Cu and Ni loaded on g-C<sub>3</sub>N<sub>4</sub> were analyzed using XRD, FTIR, FESEM and UV-vis/DRS techniques. The performance on photoreduction of Cr(VI) were determine as followed: Ag/C<sub>3</sub>N<sub>4</sub> (87%) > Cu/C<sub>3</sub>N<sub>4</sub> (85%) > Ni/C<sub>3</sub>N<sub>4</sub> (80%) > pure g-C<sub>3</sub>N<sub>4</sub> (77%). Ag/C<sub>3</sub>N<sub>4</sub> was highest performance compared to other photocatalysts due to well dispersed of Ag particle on g-C<sub>3</sub>N<sub>4</sub> as well as lowest bandgap which enhance the photoreduction of Cr(VI). Then, Ag/C<sub>3</sub>N<sub>4</sub> was carried out for other parameters such as initial pH, catalyst dosage and concentration of Cr(VI). The result shows the highest performance at pH 9, concentration of Cr(VI) at 10 mg/L and catalyst dosage at 0.0094 g L<sup>-1</sup>. Overall, the Ag loaded on g-C<sub>3</sub>N<sub>4</sub> was successfully contribute on photoreduction of Cr(VI) under visible light.

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