

**TEMPERATURE EFFECT ON THE PHOTOCATALYST &
PHOTOELECTROCHEMICAL ON SYNTHESIZED g-C₃N₄ USING UREA &
THIOUREA AS PRECURSOR**

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ABSTRACT

TEMPERATURE EFFECT ON THE PHOTOCATALYST & PHOTOELECTROCHEMICAL ON SYNTHESIZED g-C₃N₄ USING UREA & THIOUREA AS PRECURSOR

The temperature effect on the photocatalyst and synthesized g-C₃N₄ using urea & thiourea as precursor were ascertained. The effects of different temperatures (400, 450, 500, 550, and 600 °C) and heating rates (3, 5, and 10 °C/min) were determined. The results showed that the temperature of 500 °C and the heating rate of 5 °C/min for urea had potential to give the best structural, morphological, and optical characteristics of g-C₃N₄ which labelled as U550-H5. For thiourea, the sample that can enhance the performance of photocatalysis process is TU450-H5 which its temperature is at 450 °C and 5 °C/min. RR4 dye was used to measure the photocatalytic activity when exposed to visible light. EIS, LSV, and the chronoamperometry concept were used to measure the photoelectrochemical study. EIS analysis shows that U550-H5 with the help of light is performing better than TU450-H5 since it is resulting in smaller semicircle which represent the lower of R_{ct} . In LSV analysis, it was observed that no significant differences since U550-H5 and TU450-H5 show the high current in onset potential. Based on chronoamperometry analysis, U550-H5 exhibited the highest and stable photocurrent response while TU450-H5 demonstrated the lowest and unstable. The synthesized g-C₃N₄ samples were then analysed using characterization methods (FTIR and FESEM-EDX). For FTIR, it was demonstrated that urea sample at 5 °C/min leading in a more extensive aromatic since it has a stronger CH-bending vibration peak at 1236 cm⁻¹. A closer look in differentiate the temperature of urea sample indicates that the absorption peaks at 1551 cm⁻¹ is very sharp in U550-H5 compared to others. For thiourea, TU450-H10 has the highest intensity of the NH group. By differentiating its temperature, the peak approximately 1680 cm⁻¹ associated with C=S stretching in TU450-H5 shows more intense than other samples. FESEM-EDX shows that U550-H5 contain 64.8% of N higher than TU450-H5 which contain 58.3%.

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