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## Defect Induced Tuning of Photoluminescence Property in Graphitic Carbon Nitride Nanosheets through Synthesis Conditions

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### Abstract:

Synthesis of layered sheet like graphitic carbon nitride by pyrolysis of urea at different temperatures has been reported. The proper phase formation has been confirmed by X-ray diffraction study whereas field emission scanning and transmission electron microscope characterized the morphology of the material. Fourier transform infrared and Raman spectroscopy revealed the presence of different bonds in the sample. Thermal gravimetric analysis has been used to study the thermal stability of the material. Energy dispersive X-ray analysis further revealed the elemental composition of carbon and nitrogen in a proper stoichiometric ratio. Excitation dependent photoluminescence spectra of the as prepared samples have been studied in detail. It has been shown that synthesis condition can tailor the amount of defects present in the synthesized samples that in turn can change the photoluminescence properties of the material. The fluorescence spectra of the as prepared samples have been used to detect copper ions present in the sample. It has also been shown that the presence of defects which is mainly N-H functional groups can change the decay characteristics of the carrier in these samples which in turn changes the PL spectra.

**Keywords:** Carbon nitride, XRD, FESEM, Photoluminescence, N-H group defects

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