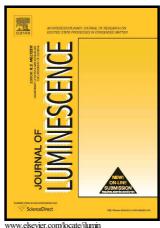
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Defect Induced Tuning of Photoluminescence Property in Graphitic Carbon Nitride

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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