

Waste Water Treatment Using Nanostructured Graphitic Carbon Nitride

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Environmental problems are emerging issues due to critical effect on living organisms. Moreover waste water purification is needed because closely related to health of human with drinking water. We developed various nanostructured carbon nitride (g-C₃N₄) which is trigonal nitrogen linked heptazine structure stacking in graphitic manner, i.e. hollow sphere and 3D cubic symmetry (c-mpg-C₃N₄) morphologies, using nanocasting method to get large surface area and expose functional groups. We can consider the functional groups as adsorption active site due to lone paired electrons on nitrogen atom. Moreover g-C₃N₄ graphitic plane is conjugated with sp² hybridization of carbon and nitrogen atom. This electronic structure is similar to organic semiconductors which are utilized as photocatalyst with suitable band gap. Herein, we utilized g-C₃N₄ as adsorbent to remove metal ions in aqueous phase. We study metal ion adsorption isotherm with respect to initial concentration, temperature and existence or nonexistence of light. Furthermore, we utilize metal ion supported g-C₃N₄ by adsorption to enhance its photocatalytic ability to degrade organic dye (rhodamine B).