

The effect of g-C₃N₄ precursors on photocatalytic activity enhancement of water-dispersible porous g-C₃N₄ photocatalysts

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At present, graphitic carbon nitride (g-C₃N₄) is considered as one of the most well-known metal-free photocatalyst. g-C₃N₄ can be prepared using nitrogen-rich precursors such as dicyandiamide (DCDA), melamine, urea and thiourea. In this study water-dispersible porous g-C₃N₄ photocatalyst were prepared from bulk g-C₃N₄ by a chemical oxidation method and their photocatalytic activity was examined under visible-light irradiation. Bulk g-C₃N₄ was obtained by different precursors in a muffle furnace at 550°C for 4 hours under air condition. Properties of bulk and porous g-C₃N₄ materials were characterized by FE-SEM, XRD, FT-IR, XPS, BET and UV-Vis absorption spectra. Porous g-C₃N₄ photocatalyst showed a high photocatalytic degradation rate of methylene blue than bulk g-C₃N₄. The improvement of adsorption ability in porous g-C₃N₄ are responsible for the high photocatalytic activity of porous g-C₃N₄. Moreover, the existence of sulfur in thiourea caused the different interaction in the preparation, resulting in a high activity.