

Crystalline polymeric carbon nitrides for solar fuel production

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Polymeric carbon nitride (PCN) is a promising candidate for photocatalytic hydrogen production, but suffers from insufficient light absorption and sluggish charge carrier transfer. Herein, we synthesized crystalline polymeric carbon nitride obtained from the temperature-induced condensation of urea by using a salt melt of lithium chloride and potassium chloride as the solvent which is called ionothermal method. The crystalline carbon nitride showed decreasing trend in PL intensity compared to bulk carbon nitride. And efforts to tune the electronic structure of carbon nitride by introducing metal ions affected on light absorption property, contributing to greater visible light absorption. As a result, the crystalline polymeric carbon nitride exhibited efficient photocatalytic performance with enhanced optical absorption, charge transfer and exciton dissociation under visible light irradiation.