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Catalysis, kinetics and reaction engineering

Porous g-C_3N_4 with enhanced adsorption and visible-light photocatalytic performance for removing aqueous dyes and tetracycline hydrochloride#

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Abstract: Porous g-C_3N_4 samples were obtained by simply calcining bulk g-C_3N_4 in static air in a muffle oven. The photocatalytic performance of these samples was evaluated through the removal of aqueous organic dyes (methylene blue and methyl orange) and tetracycline hydrochloride under visible-light irradiation (λ>420 nm). Compared to bulk g-C_3N_4, porous g-C_3N_4 exhibited much better capability for removing these contaminants, especially under visible-light irradiation, due to the enlarged specific surface area and more efficient separation of photogenerated charge carries. In particular, porous g-C_3N_4 obtained by calcining bulk g-C_3N_4 in air at 525°C showed the highest visible-light-driven catalytic activity among these samples. Superoxide radical anions ($\bullet O_2^-$) were found to be the primary active species responsible for photodegradation.

Keywords: C_3N_4; Catalyst; Reaction; Waste treatment; Dyes; Tetracycline hydrochloride

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