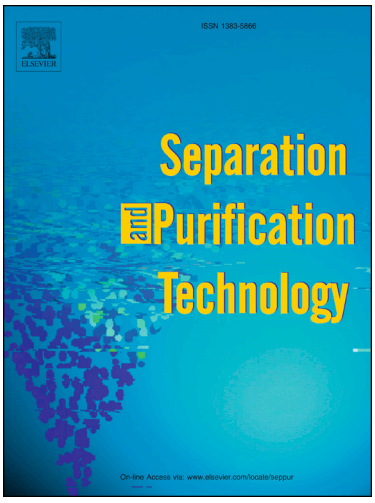

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In-situ synthesis of sulfur doped carbon nitride microsphere for outstanding visible light photocatalytic Cr(VI) reduction

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Abstract

Sulfur doped graphitic carbon nitride microspheres were synthesized from in situ solvothermal condensation process using trithiocyanuric acid as sulfur source. The photocatalytic activity for Cr(VI) reduction and mechanism on sulfur doped carbon nitride microspheres were investigated in detail. Structure characterizations reveal that the as-prepared sample has incomplete heptazine heterocyclic ring structure. The sulfur species doped into the lattice of carbon nitride was identified as formation of C-S and N-S in the hybrid framework. Improved conjugated structure, expanding visible light harvesting and elevated conduction band reduction potential were realized by sulfur doping. The photocatalytic activities of the sulfur-doped carbon nitride were evaluated by Cr(VI) reduction under visible light in neutral aqueous solution. After sulfur doping, the catalysts showed much enhanced Cr(VI) reduction rate, about 24 times higher than un-doped sample. This work provides a new strategy for the preparation of sulfur doped