Silver nanoparticle sensitized MoS_2 microflowers grown on carbon cloth for photocatalytic degradation of Rhodamine B

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Advances in photocatalytic engineering include an insight of the design and production of visible light absorption photocatalysts. Structures based on heterojunctions, and metal nanoparticle sensitized frames, open up the possibilities of developing materials that are distinctly active and improves charge separation. Free standing photocatalytic system have attracted interest recently because of hassle free separation of catalyst. In this perspective, MoS_2 microflowers were grown on the surface of a carbon cloth through a simple hydrothermal method. Ag nanoparticles on the surface of the as-grown MoS_2 microflowers were deposited by sodium borohydride reduction. The as grown Ag@MoS_2 on carbon cloth was directly used for photocatalytic reaction against Rhodamine B aqueous solution, a model pollutant. Significant improvement in the photocatalytic degradation was observed with Ag sensitization over MoS_2 surface facilitating numerous oxidative radical species. Hydroxyl radicals were found to be the major species during photocatalytic reaction. The mechanism of the developed photocatalyst was deduced and the reliability of the photocatalyst was also investigated.