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One-pot solvothermal synthesis of Bi/BiOBr mesh for visible-light-driven photocatalytic bacterial inactivation

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The emergence of pathogenic bacteria in surface water poses serious threats to public health worldwide, which commonly cause infectious waterborne diseases in human. Thus, it is one of the great importance to develop effective disinfection strategies for adequate inactivation of pathogenic microorganisms in water. In recent years, semiconductor photocatalysis has attracted growing interest as a promising technique for removal of bacterial contaminations owing to its powerful photocatalytic ability. However, the solid photocatalysts usually make the recovery inevitably depend on expansive separation processes. The great challenge of photocatalyst recovery severely limits their industry applications. Herein, Bi/BiOBr mesh with flower-like hierarchical microstructure was fabricated on the 304 stainless steel wire mesh substrates via a one-pot solvothermal route. This Bi/BiOBr mesh showed a rapid photocatalytic inactivation of >99.98% *E. coli* and >99.92% *S. aureus* in 180 min under visible light irradiation. More importantly, the Bi/BiOBr mesh was easily separated and recycled, which is a significant advance in comparison with the previously reported photocatalysts in form of powders and nanoparticles. Therefore, with a marvelous combination of facile fabrication, visible-light response and easy recycling characteristic, this novel photocatalyst is expected to have great potential applications in water purification and disinfection.

Biography

Chunping Su has completed her PhD, majored in Applied Chemistry from Wuhan Institute of Technology, China. Her research focuses on environmental catalytic materials and functional interface materials. She has published three papers in international journals as the first author.

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