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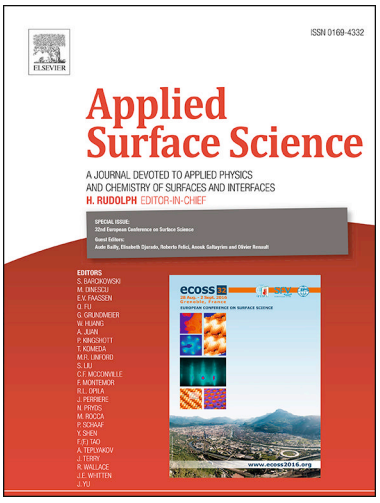

Full Length Article

Fabrication of BiOI@UIO-66(NH_2)@g-C_3N_4 ternary Z-scheme heterojunction with enhanced visible-light photocatalytic activity

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Fabrication of BiOI@UIO-66(NH_2)@g-C_3N_4 ternary Z-scheme heterojunction with enhanced visible-light photocatalytic activity.

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Abstract:

A novel ternary heterojunction BiOI@UIO-66(NH_2)@g-C_3N_4 (BiOI@UNCN) was synthesized by *in-situ* solvothermal-hydrothermal approach, showing superior photocatalytic degradation of RhB and TC under visible-light irradiation. The optimal BiOI@UNCN-40 composite exhibits the highest degradation efficiency of RhB (95%) in 80 min and TC (80%) in 180 min in comparison with pristine BiOI, UIO-66(NH_2) and UIO-66(NH_2)@g-C_3N_4. The improved photocatalytic activity of BiOI@UNCN can be ascribed to its improved visible-light absorption range, the large specific surface area based on UIO-66(NH_2) as well as the formation of an effective n-p-n type heterojunction driven by Z-scheme mechanism. The formed Z-scheme mechanism at the interface of ternary composite facilitates the separation and transfer of photoexcited charge carrier, which is confirmed from the results of PL and EIS spectra. The photocatalytic mechanism is further proposed based on the trapping experiment, and the transfer process of photoinduced electron-hole pairs is discussed. This work provides an effective strategy for designing a new ternary photocatalytic system toward degradation of organic pollutants.

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