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Zuming He, Yongmei Xia, Bin Tang, Xingfang Jiang, Jiangbin Su

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Fabrication and photocatalytic property of ZnO/Cu_2O core-shell nanocomposites

Zuming He[a,c]*, Yongmei Xia[b]*, Bin Tang[c], Xingfang Jiang[c] and Jiangbin Su[c]

[a] Huaide college, Changzhou University, Jiangsu 213164, China

[b]School of Materials and Engineering, Jiangsu University of Technology, Jiangsu 213001, China

[c]School of Mathematics & Physics, Changzhou University, Jiangsu 213164, China

hzm432928@cczu.edu.cn

xiaweiwei906@126.com

*Corresponding authors. Tel.: +86 83290196.

ABSTRACT

ZnO/Cu_2O core-shell nanocomposites (ZnO/Cu_2O CSNCs) were successfully synthesized by a facile solution method. The samples were characterized by XRD, XPS, SEM, TEM and UV-vis absorption spectra. Results showed that ZnO nanorods coated by Cu_2O nanoparticles formed typical core-shell structures, and the ZnO/Cu_2O CSNCs were able to absorb a large part of visible light and exhibited an excellent photocatalytic activity. It was found that the n-ZnO/p-Cu_2O heterojunction played a key role in enhancing photocatalytic activity of the ZnO/Cu_2O CSNCs.

Graphical abstract

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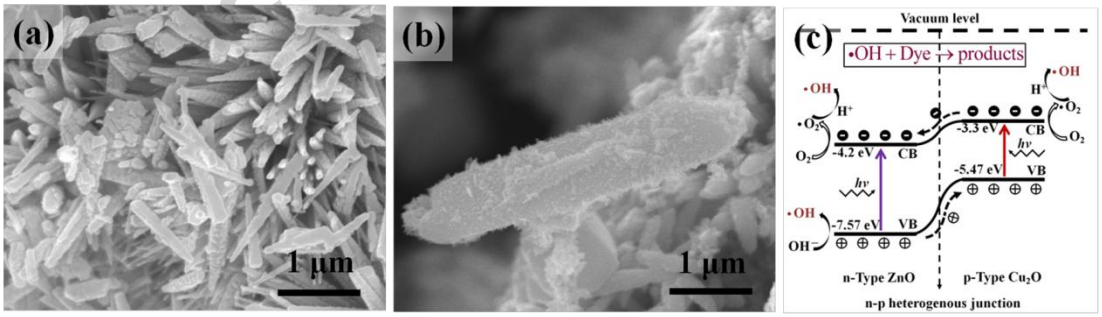

Fig. FESEM images of ZnO nanorods (a) and ZnO/Cu_2O core-shell nanocomposites (b); Schematic illustration of excitation and separation of photoinduced electron-hole pairs for ZnO/Cu_2O heterojunction under UV-vis irradiation (c).