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Zn-vacancy mediated electron-hole separation in ZnS/g-C_3N_4 heterojunction for efficient visible-light photocatalytic hydrogen production

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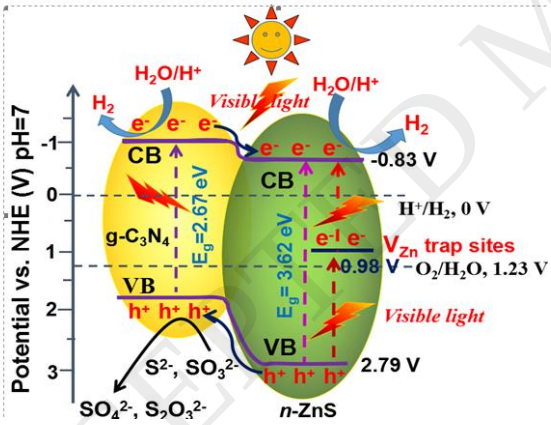
Graphical abstract



ZnS/g-C3N4 heterostructured material with abundant zinc vacancy defects on the surface of ZnS has been studied to emphasis the synergistic promotion on charge separation. This heterostructured photoctalyst exhibits more than 30 times higher H2 evolution rate than that of pristine g-C3N4 under visible-light irradiation and high stability. The enhanced photocatalytic performance can be attributed to the intimate interfacial contact between g-C3N4 and ZnS nanoparticles, increasing the light-absorbing capacity and charge separation efficiency of ZnS/g-C3N4 heterojunction. And more importantly, the visible-light photocatalytic H2 production activity can be ascribed to the two-photo excitation in the middle band gap of ZnS.