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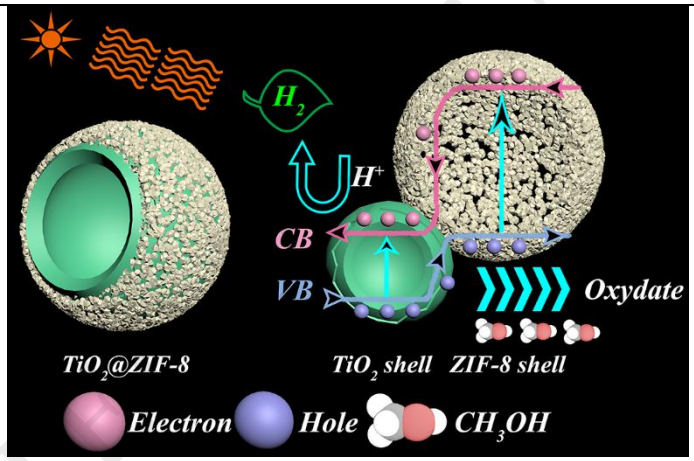
Graphical abstract



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A double-shell TiO_2@ZIF-8 hybrid composite, synthesized via carboxylation and sonocrystallization, was fully characterized. The efficient capacity of H_2 evolution driven by visible light and its photocatalytic pathway was studied. The results showed that photocatalytic H_2 evolution over hollow TiO_2 can be greatly improved with the use of ZIF-8 as active-sites supplier and charge separator.

Highlights

- TiO_2@ZIF-8 hybrid composites were synthesized rapidly via sonocrystallization