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Communication

Synergistic effects of CdS in sodium titanate based nanostructures for hydrogen evolution

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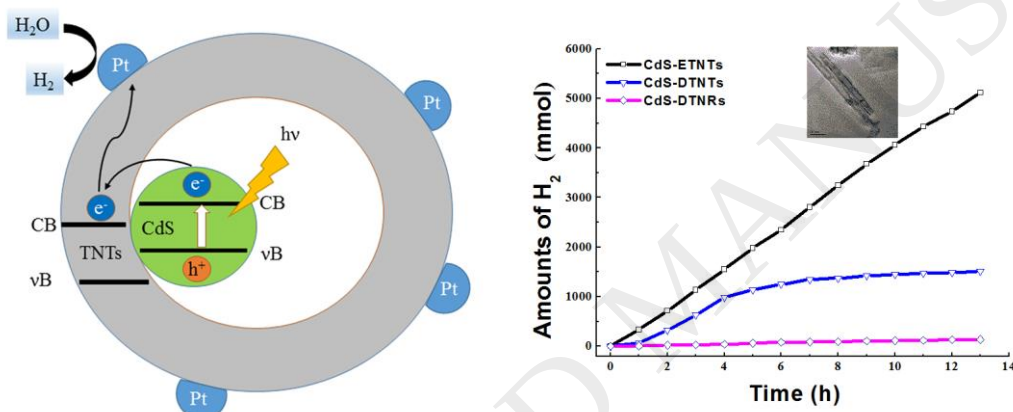
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Graphical Abstract



Synergistic effect of CdS decorated sodium titanate nanostructures showed enhanced H₂ production abilities. The confinement effect and synergistic effect of decorated CdS inside the sodium titanate nanotubes are investigated.

ABSTRACT

In this paper, nanotubes and nanoribbons of sodium titanate structures were synthesized *via* hydrothermal methods in alkaline solution. CdS decorated titanate nanotubes and nanoribbons were therefore constructed for exploring the performance of hydrogen evolution and synergistic effect of CdS based titanate structures. CdS decorated titanate nanotubes and nanoribbons were characterized by high resolution transmission electron microscopy (HRTEM), X-ray diffraction (XRD), UV-vis, Brunauer-Emmett-Teller (BET) and X-ray photoelectron spectroscopy (XPS) measurements. CdS encapsulated in titanate nanotubes (CdS-ETNTs) showed the best capacity of H₂ evolution by water splitting and stability than that from the other two structures, *i.e.*, CdS doped titanate nanotubes (CdS-DTNTs) and CdS doped titanate nanoribbons (CdS-DTNRs), which could be explained by the synergistic effect of decorated CdS with sodium titanate structures and confinement effect of CdS nanoparticles encapsulated inside

Keywords:

CdS

Sodium titanate nanotubes

Sodium titanate nanoribbons

H₂ generation

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