

Photocatalytic hydrogen generation from water with metal loaded strontium titanate nanofibers

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Abstract:

Hydrogen production rate via photocatalytic water-splitting of strontium titanate nanofibers was improved via silver and cobalt loading. The loading of the metal salts was achieved via photodeposition and co-electrospinning. The metal loaded photocatalysts were characterized via field-emission scanning electron microscopy with energy dispersive spectroscopy (FE-SEM/EDS), X-ray diffraction (XRD) analysis, UV-visible spectroscopy, and photo-electron yield spectroscopy. Hydrogen production rates were found to be improved up to as high as $2.5 \text{ mmol h}^{-1} \text{ g}^{-1}$ for Co^{2+} loading and as high as $1.8 \text{ mmol h}^{-1} \text{ g}^{-1}$ for Ag^+ loading. The improvement photocatalytic rates were majorly attributed to the change in electronical properties of SrTiO_3 with the loading of the metals.

Keywords: Electrospinning; strontium titanate; nanofiber; photocatalyst; hydrogen generation

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