Ag and CoFe₂O₄ co-sensitized TiO₂ nanowire for photocathodic protection of 304 SS under visible light

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Ag and CoFe₂O₄ co-sensitized TiO₂ nanowire (NW) structures were fabricated by photoreduction deposition and hydrothermal methods. The morphology, chemical composition and optical absorption capabilities of the nanocomposites were systematically investigated by scanning electron microscopy (SEM), X-ray photoelectron spectroscopy (XPS) and UV–visible absorption spectra methods. The photo-induced open circuit potential (OCP) and photocurrent density were measured under visible light to evaluate the photocathodic protection effects of the nanocomposites for 304 SS in the presence and absence of illumination. The results indicated that the deposition of Ag and CoFe₂O₄ nanoparticles (NPs) shifted the light absorption of TiO₂ to the visible light region and enhanced the separation efficiency of the photogenerated charges. The nanocomposite exhibited more efficient photocathodic protection for 304 SS compared with pure TiO₂ under visible light.

Keywords: TiO₂; CoFe₂O₄; Ag; photocathodic protection

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