

## عنوان مقاله:

Optimization of Ag loaded TiO<sub>2</sub> nanotube arrays for plasmonic photoelectrochemical water splitting

## محل انتشار:

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## خلاصه مقاله:

In this paper we report on a notable improvement of the photoelectrochemical (PEC) properties of highly ordered Ag loaded TiO<sub>2</sub> nanotube arrays (Ag/TNT). Electrochemical anodization and sequential chemical bath deposition with an optimum ratio of precursors were employed for the production of an Ag/TNT nanocomposite. X-ray diffraction analysis (XRD) and scanning electron microscopy SEM images indicate that the Ag nanoparticles were deposited completely on the surface of the pore wall of TiO<sub>2</sub> nanotube arrays. The photoelectrochemical measurements, including LSV, chronoamperometry and EIS, indicate that the Ag/TNT sample with a ratio of 1 precursors exhibited the maximum photoelectrochemical efficiency with a photocurrent density of about 300  $\mu$ A, which is at least 3 times greater than a pure TNT sample. PEC and EIS measurements show that because of the localized surface plasmon resonance (LSPR) effects of Ag nanoparticles, an effective separation of photogenerated electron-hole pairs occurs that led to a reduction of charge transfer resistance at the interface and enhanced the PEC properties of the Ag/TNT sample.

## کلمات کلیدی:

Ag/TNT nanocomposite, semiconductor, photoelectrochemical water splitting, surface plasmon resonance

## لینک ثابت مقاله در پایگاه سیویلیکا:

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