

Improving PEC Efficiency by Enhancing Light Absorption from Laser Patterned Cu₂O Film

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ABSTRACT

Cuprous oxide (Cu₂O) is increasingly employed as a cathode material in photoelectrochemical (PEC) systems due to its favorable properties for water splitting. This study introduces an innovative approach to enhance the performance of Cu₂O cathodes by applying laser irradiation to create dot patterns on the electrode surface. The patterning technique expanded the surface area and improved the light absorption capabilities of Cu₂O. The introduction of dot patterns allowed for more efficient light harvesting and increased the reactive sites available for water reduction. These enhancements lead to an increased current density at the hydrogen reduction potential, consequently expecting more hydrogen production in PEC systems.

KEY WORDS

Cu₂O, Laser, Dot patterning