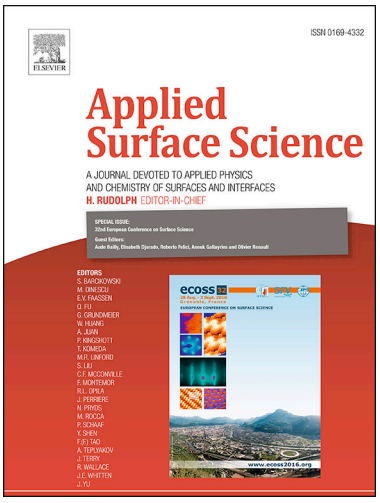

Full Length Article

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Visible-light driven nitrogen-doped petal-morphological ceria nanosheets for water splitting

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Abstract: Water splitting is a promising sustainable technology for solar-to-chemical energy conversion. Herein, we successfully fabricated nitrogen-doped ultrathin CeO_2 nanosheets by using field poppy petals as templates, which exhibit an efficiently catalytic activity for water splitting. Abundant oxygen vacancies and substitutional N atoms were experimentally observed in the film due to its unique biomorphic texture. In view of high efficiency and long durability of the as-prepared photocatalyst, this biotemplate method may provide an alternative technique for using biomolecules to assemble 2D nanomaterials.

Keywords: Biotemplate; CeO_2; Water splitting; Nitrogen-doped; Oxygen vacancies.

1. Introduction

Hydrogen as a central energy carrier demonstrates a greater versatility from direct use in internal combustion engines, gas turbines or fuel cells for both distributed heat and electricity generation needs [1-4]. As an inexpensive, nonpolluting and abundant renewable route of production, hydrogen conversion from solar energy via photocatalytic water splitting provides a sustainable and more uniform energy supply