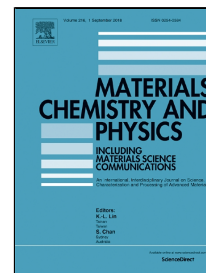


Accepted Manuscript

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PII: S0254-0584(18)30697-7

DOI: 10.1016/j.matchemphys.2018.08.032

Reference: MAC 20875

To appear in: *Materials Chemistry and Physics*

Received Date: 13 June 2018

Accepted Date: 12 August 2018

Please cite this article as: Sagar Balgude, Yogesh Sethi, Bharat Kale, Dinesh Amalnerkar, Parag Adhyapak, Sn₃O₄ microballs as highly efficient photocatalyst for hydrogen generation and degradation of phenol under solar light irradiation, *Materials Chemistry and Physics* (2018), doi: 10.1016/j.matchemphys.2018.08.032

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Sn₃O₄ microballs as highly efficient photocatalyst for hydrogen generation and degradation of phenol under solar light irradiation

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Abstract:

Succinate driven facile hydrothermal method for fabrication of Sn₃O₄ microballs have been reported. The crystal structure of triclinic Sn₃O₄ was confirmed by XRD and Raman spectroscopy. The FESEM analysis reveals microball-like morphology made up of irregular contour-like nanostructures with thickness of about 40-80 nm. The optical band gap calculated from optical absorption spectroscopy was found to be 2.62 eV for synthesized Sn₃O₄. Considering morphology and narrowing of band gap, the photocatalytic activities for hydrogen generation and phenol degradation was investigated under solar light irradiation. Sn₃O₄ nanostructure exhibited enhanced photocatalytic activities for hydrogen generation and phenol degradation. A maximum H₂ generation (88.4 μmol h⁻¹/0.1 g) was obtained using the microball-like Sn₃O₄, which is higher than earlier reported data. Sn₃O₄ also exhibits good phenol degradation activity. The high photocatalytic activity of Sn₃O₄ was considered to be due to narrow band gap and hierarchal microball-like morphology.

Key words: Sn₃O₄ nanostructure, microballs, Hydrothermal, Photocatalysts

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