

Accepted Manuscript

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PII: S1386-1425(18)30286-5
DOI: [doi:10.1016/j.saa.2018.03.078](https://doi.org/10.1016/j.saa.2018.03.078)
Reference: SAA 15950

To appear in: *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*

Received date: 19 January 2018
Revised date: 26 March 2018
Accepted date: 28 March 2018

Please cite this article as: Yeqiu Wu, Tao He , Ag loading induced visible light photocatalytic activity for perovskite SrTiO₃ nanofibers. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Saa(2017), doi:[10.1016/j.saa.2018.03.078](https://doi.org/10.1016/j.saa.2018.03.078)

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Ag loading induced visible light photocatalytic activity for perovskite SrTiO₃ nanofibers

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Abstract: The synthesis and photocatalytic activities of Ag-SrTiO₃ nanofibers were reported in this work. The fabricated Ag-SrTiO₃ nanofibers were characterized by TG-DSC, XRD, IR, XPS, SEM, TEM, DRS and ESR techniques. The XRD and IR results show that Ag-SrTiO₃ nanofibers have a perovskite structure after the heat treatment at 700 °C. The XPS result shows that Ag element exists as Ag⁰ in the fabricated Ag-SrTiO₃ nanofibers. The SEM and TEM images indicate the obtaining of nanofibers with porous structure. The photocatalytic activity of Ag-SrTiO₃ nanofibers was evaluated by degrading RhB and MB under visible light irradiation. The Ag-SrTiO₃ nanofibers show excellent photocatalytic activity under visible light irradiation because of the surface plasmon resonance effect of Ag⁰. In the photocatalysis process of RhB and MB, lots of hydroxyl radicals were generated, which plays the key role in the decomposition of organic pollutants.

Keywords: Ag-SrTiO₃; Nanofibers; Surface plasmon resonance; Photocatalysis.

1. Introduction

Energy shortage and environmental pollution are two most critical issues facing

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