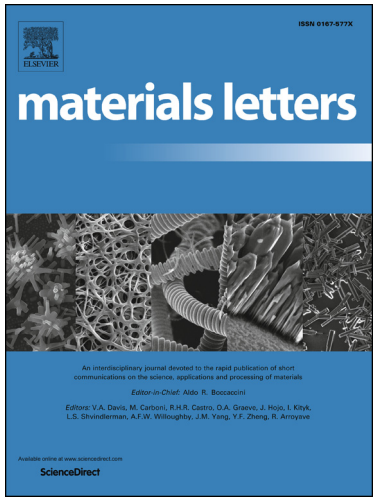

Sonochemical Synthesis and Loading of PbS Nanoparticles into Mesoporous Silica

Elif Akbay, Tufan Gür Ölmez

PII: S0167-577X(17)31884-0
DOI: https://doi.org/10.1016/j.matlet.2017.12.117
Reference: MLBLUE 23615

To appear in: *Materials Letters*

Received Date: 24 October 2017
Revised Date: 21 December 2017
Accepted Date: 25 December 2017

Please cite this article as: E. Akbay, T.G. Ölmez, Sonochemical Synthesis and Loading of PbS Nanoparticles into Mesoporous Silica, *Materials Letters* (2017), doi: https://doi.org/10.1016/j.matlet.2017.12.117

Sonochemical Synthesis and Loading of PbS Nanoparticles into Mesoporous Silica

Elif Akbay[a], Tufan Gür Ölmez

Chemical Engineering, Anadolu University, Eskişehir, Turkey

[a]Corresponding Authors: eodes@anadolu.edu.tr

Abstract

A sonochemical method was used for simultaneous synthesis and loading of lead sulfide (PbS) nanoparticles into mesoporous SBA-15(Santa Barbara Amorphous). In this study, the effect of different loading ratios (30, 45, 60, 75%) on morphology, crystalline structure and physicochemical characteristics of PbS-SBA-15_samples was investigated. TEM images showed that the PbS nanoparticles were highly dispersed inside the SBA-15 pores for all tested loadings, however especially 60 and 75%-PbS-SBA-15_samples exhibited significant surface aggregation of PbS on SBA-15 surface. Also, PbS-SBA-15_samples showed a strong UV light absorption at about 290-310 nm with increasing band gap energies, which is indicative of quantization effects.

Keywords: PbS, SBA-15, sonochemical synthesis, Semiconductor