

## Accepted Manuscript

### One-Pot Sonochemical Synthesis of Hg–Ag Alloy Microspheres from Liquid Mercury

Villa Krishna Harika, Vijay Bhooshan Kumar, Aharon Gedanken

PII: S1350-4177(17)30305-X

DOI: <http://dx.doi.org/10.1016/j.ultsonch.2017.07.008>

Reference: ULTSON 3763

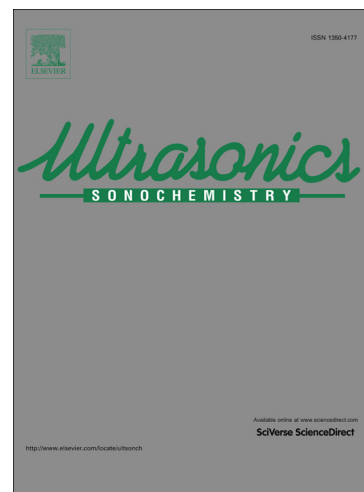
To appear in: *Ultrasonics Sonochemistry*

Received Date: 13 April 2017

Revised Date: 5 July 2017

Accepted Date: 5 July 2017

Please cite this article as: V.K. Harika, V.B. Kumar, A. Gedanken, One-Pot Sonochemical Synthesis of Hg–Ag Alloy Microspheres from Liquid Mercury, *Ultrasonics Sonochemistry* (2017), doi: <http://dx.doi.org/10.1016/j.ultsonch.2017.07.008>



This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# One-Pot Sonochemical Synthesis of Hg–Ag Alloy Microspheres from Liquid Mercury

Villa Krishna Harika, Vijay Bhooshan Kumar and Aharon Gedanken\*

Bar-Ilan Institute for Nanotechnology and Advanced Materials, Department of Chemistry,  
Bar-Ilan University, Ramat Gan 5290002, Israel

\*Email: gedanken@biu.ac.il

## Abstract

Metallic mercury has always attracted much attention in various fields because of its unique characteristic of forming amalgams. Here, different phases of pure crystalline Hg–Ag amalgam microspheres are synthesized by ultrasonically reacting liquid mercury with an aqueous solution of silver nitrate. Sonicating different molar ratios of liquid metallic Hg with AgNO<sub>3</sub> results in the formation of pure crystalline phases of solid silver amalgams with uniform morphology. The resulting Hg–Ag amalgams from various compositions after sonication are physically characterized by X-ray diffraction (XRD), SEM, Energy dispersive X-ray spectroscopy (EDS) and differential scanning calorimetry (DSC). The XRD of the amalgams obtained from the molar ratios of Hg:Ag (1:1.5) and Hg:Ag (1.5:1 and 2:1) match the Schachnerite and Moschellandbergite phases, respectively, whereas the Hg–Ag amalgam prepared from a 1:1 Hg:Ag molar ratio results in a mixture of the Schachnerite and Moschellandbergite phases. The obtained amalgam microspheres are between 6 and 10  $\mu\text{m}$  in size. The detailed thermal and chemical behaviour of the Ag–Hg systems is also investigated.

**Keywords:** Hg–Ag microspheres; sonochemical synthesis; amalgams; Schachnerite phase; Moschellandbergite phase

## 1. Introduction

Mercury (Hg), a unique metallic element in the periodic table, with special potential characteristics, is referred to as a semisolid. Naturally available forms of metallic mercury are

Download English Version:

<https://daneshyari.com/en/article/5144439>

Download Persian Version:

<https://daneshyari.com/article/5144439>

[Daneshyari.com](https://daneshyari.com)