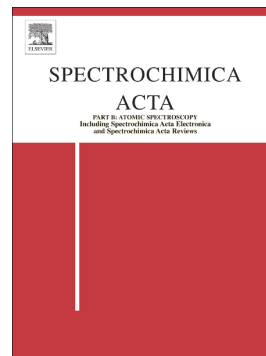


## Accepted Manuscript

Mechanism of action of additives in chemical vapor generation of hydrogen selenide: Iodide and thiocyanate

Emanuela Pitzalis, Massimo Onor, Roberto Spiniello, Carlos Eduardo Mendes Braz, Alessandro D'Ulivo



PII: S0584-8547(17)30598-0  
DOI: doi:[10.1016/j.sab.2018.04.005](https://doi.org/10.1016/j.sab.2018.04.005)  
Reference: SAB 5409

To appear in: *Spectrochimica Acta Part B: Atomic Spectroscopy*

Received date: 11 December 2017  
Revised date: 10 April 2018  
Accepted date: 12 April 2018

Please cite this article as: Emanuela Pitzalis, Massimo Onor, Roberto Spiniello, Carlos Eduardo Mendes Braz, Alessandro D'Ulivo, Mechanism of action of additives in chemical vapor generation of hydrogen selenide: Iodide and thiocyanate. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sab(2017), doi:[10.1016/j.sab.2018.04.005](https://doi.org/10.1016/j.sab.2018.04.005)

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.

## Mechanism of action of additives in chemical vapor generation of hydrogen selenide: iodide and thiocyanate.

Emanuela Pitzalis<sup>a</sup>, Massimo Onor<sup>a</sup>, Roberto Spiniello<sup>a</sup>, Carlos Eduardo Mendes Braz<sup>b</sup>, Alessandro D'Ulivo<sup>a\*</sup>

a) C.N.R., Institute of Chemistry of Organometallic Compounds, S.S. of Pisa, Via G. Moruzzi, 1 54124 Pisa, Italy

b) Grupo de Análise Instrumental Aplicada, Departamento de Química, Universidade Federal de São Carlos, 13565-905 São Carlos-SP, Brazil

### Abstract

The chemical vapor generation of H<sub>2</sub>Se has been investigated in the presence and in the absence of either NaI or NaSCN as additives (0.5 mol L<sup>-1</sup>), in HClO<sub>4</sub> media (0.1 – 5.0 mol L<sup>-1</sup>) and using a low concentration of NaBH<sub>4</sub> (0.02 mol L<sup>-1</sup>). The enhancement of generation efficiency of H<sub>2</sub>Se produced by iodide and thiocyanate was measured by a continuous flow reaction system coupled with a miniature argon-hydrogen diffusion flame and atomic absorption detection. The chemifold of the continuous flow reactor was designed in order to change the mixing sequence and the interaction time of the reagents. By this way it has been possible to evaluate the contribution of additive-selenium and additive-borane species to the mechanism producing the increase of generation efficiency of H<sub>2</sub>Se. Both the iodide complexes of selenium and borane contribute to enhance generation efficiency of H<sub>2</sub>Se, whereas the thiocyanate complexes of selenium rather than thiocyanate-borane complexes play a major role in the enhancement of the efficiency. At elevated acidities ( $2 < [H^+] < 5 \text{ mol L}^{-1}$ ), only thiocyanate continues to maintain its properties to increase H<sub>2</sub>Se generation efficiency while iodide causes a marked signal depression unless its addition is performed after the starting of Se<sup>IV</sup>- [BH<sub>4</sub><sup>-</sup>] reaction with an appropriate time delay. Both iodide and thiocyanate caused marked depression of H<sub>2</sub>Se generation when NaBH<sub>4</sub> was replaced by the amine boranes, NH<sub>3</sub>-BH<sub>3</sub> and *tert*-ButylNH<sub>2</sub>-BH<sub>3</sub>.

Download English Version:

<https://daneshyari.com/en/article/7673842>

Download Persian Version:

<https://daneshyari.com/article/7673842>

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