

Schiff-base assisted synthesis of lead selenide nanostructures

Bahareh Shoshtari-Yeganeh, Masoud Salavati-Niasari*

Department of Inorganic Chemistry, Faculty of Basic Chemistry, university of kashan, kashan, Iran
(e-mail: salavati@kashanu.ac.ir)

In this work, nanostructured PbSe materials have been prepared via a solvothermal method at 180 °C with the aid of new lead precursors like Schiff-base compounds; Pb(salpn) and Pb(salophen) complexes. Besides lead complexes as lead precursor, SeCl₄, and N₂H₄.H₂O (Hydrazine) as starting materials were used and propylene glycol (PG) as solvent was applied in this work. On the other hand, the effect of preparation factors such as type of reducing and capping agent on the morphology of PbSe nanostructures was investigated. The as-prepared PbSe nanostructures were characterized by XRD, SEM, TEM, EDS, and FT-IR. The SEM micrographs of the products indicated that PbSe nanostructures with lower particle size were obtained after solvothermal treatment for 3 h at 180 °C in the presence of hydrazine hydrate as reducing agent. Mechanism of synthesized PbSe was studied. The as-obtained results indicated that pure and homogeneous PbSe nanostructures have been form by using Pb(salpn) as precursor.

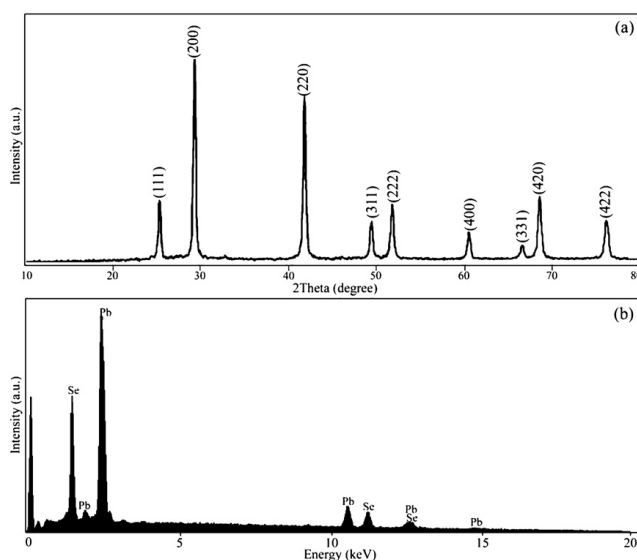


Fig. 1.(a) XRD pattern and (b) EDS spectrum of sample PbSe.

References

- 1 A. Henglein, *Chem. Revs.*, 1989, **89**, 1861-1873.
- 2 V. Sholin, A.J. Breeze, I.E. Anderson, Y. Sahoo, D. Reddy, S.A. Carter, *Sol. Energy Mater. Sol. Cells.*, 2008, **92**, 1706-1722.
- 3 D. H. Cui, J. Xu, T. Zhu, G. Paradee, S. Ashok, M. Gerhold, *Appl. Phys. Lett.*, 2006, **88**, 183111–183113.
- 4 X. Wang, K. Li, Y. Dong, K. Jiang, *Cryst. Res. Technol.*, 2010, **45**, 94-98.
- 5 F. Mohandes, F. Davar, M. Salavati-Niasari, *J. Magn. Magn. Mater.*, 2010, **322**, 872-877.
- 6 F. Zhang, F.-L. Bei, J.-M. Cao, X. Wang, *J. Solid State Chem.*, 2008, **181**, 143-149.