

Accepted Manuscript

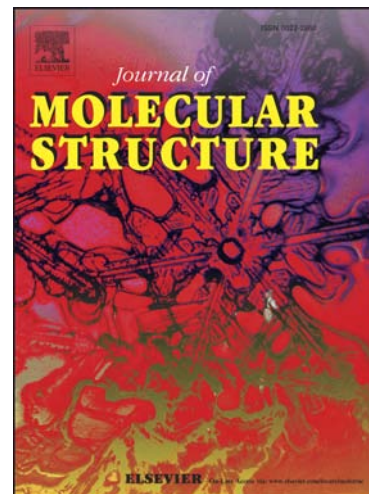
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PII: S0022-2860(13)00359-1
DOI: <http://dx.doi.org/10.1016/j.molstruc.2013.04.050>
Reference: MOLSTR 19705

To appear in: *Journal of Molecular Structure*

Received Date: 28 January 2013
Revised Date: 18 April 2013
Accepted Date: 19 April 2013



Please cite this article as: M. Rahimi-Nasrabadi, S.M. Pourmortazavi, M.R. Ganjali, S.S. Hajimirsadeghi, M.M. Zahedi, Electrosynthesis and Characterization of Zinc Tungstate Nanoparticles, *Journal of Molecular Structure* (2013), doi: <http://dx.doi.org/10.1016/j.molstruc.2013.04.050>

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Electrosynthesis and Characterization of Zinc Tungstate Nanoparticles

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Abstract:

Zinc tungstate nanoparticles with different sizes are produced through an electrolysis process including a zinc plate anode in sodium tungstate solution. The shape and size of the product was found to be controlled by varying reaction parameters such as electrolysis voltage, stirring rate of electrolyte solution and temperature. The morphological (SEM) characterization analysis was performed on the product and UV-Vis spectrophotometry and FT-IR spectroscopy was utilized to characterize the electrodeposited nanoparticles. Study of the particle size of the product versus the electrolysis voltage showed that, increasing the voltage from 4 to 8 V, led to the particle size of zinc tungstate to decrease, but further increasing the voltage from 8 to 12 V, the particle size of the produced particles increased. The size and shape of the product was also found to be dependent on the stirring rate and temperature of the electrolyte solution. X-ray diffraction (XRD), scanning electron microscopy (SEM), FT-IR spectroscopy, and photoluminescence, were used to study the structure as well as composition of the nano-material prepared under optimum conditions.

Key words: Zinc tungstate; Nanostructure; Electrodeposition; Zn; Statistical optimization

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