

Accepted Manuscript

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PII: S0167-7322(17)30861-9
DOI: doi: [10.1016/j.molliq.2017.05.122](https://doi.org/10.1016/j.molliq.2017.05.122)
Reference: MOLLIQ 7414

To appear in: *Journal of Molecular Liquids*

Received date: 28 February 2017
Revised date: 2 May 2017
Accepted date: 26 May 2017

Please cite this article as: M.A. Ahmed, Samiha T. Bishay, S.M. Abd-Elwahab, Rania Ramadan , Removing lead ions from water by using nanocomposite (rare earth oxide/alumina), *Journal of Molecular Liquids* (2017), doi: [10.1016/j.molliq.2017.05.122](https://doi.org/10.1016/j.molliq.2017.05.122)

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Removing lead ions from water by using nano composite (rare earth oxide/alumina)

M. A. Ahmed⁽¹⁾, Samiha T. Bishay⁽²⁾, S. M. Abd-Elwahab⁽¹⁾ and Rania Ramadan^{(1)*}

⁽¹⁾ Materials Science Lab (1), Physics Department, Faculty of Science, Cairo University, Giza Egypt.

⁽²⁾ Physics Department, Faculty of Girls for Arts, Science and Education, Ain Shams University, Cairo Egypt

Abstract

Alumina nanoparticles were prepared using reverse microemulsion method with particle size 3.8nm. Also, the precipitation method was utilized to prepare samarium and dysprosium oxides with particle size 14nm and 8.6nm respectively. Nano composites consist of $(x)R_2O_3/(100-x)y$ -Alumina; ($x=16$ and 44), ($R=Sm$ and Dy) and ($y=\gamma$ and α) were prepared with milling method. The characterization of all the prepared samples was studied using XRD analyses, transmitted electron microscope (TEM) and atomic force microscope (AFM). The removal efficiency of each prepared sample was measured using the atomic absorption spectroscopy. The study has clarified that the efficiency of the nano composite $(x)Sm_2O_3/(100-x)\gamma$ -alumina; $x=16$ to remove lead ions from water after 24h is about 99.3%.

Keywords: A. composite, B. Chemical preparation, C. Atomic force microscope- TEM-XRD-atomic absorption spectroscopy, D. crystal structure

***Corresponding author** Dr. Rania Ramadan, rramadan@sci.cu.edu.eg

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