

13<sup>TH</sup> INTERNATIONAL CONFERENCE ON

## ADVANCED MATERIALS AND NANOTECHNOLOGY

OCTOBER 26-28, 2017 OSAKA, JAPAN

**Purification of waste waters contaminated with heavy metals using filters made of advanced silica based materials****Andreea Georgiana Baraitaru, Marius Viorel Olteanu, Marius Constantin Raischi and Gyorgy Deak**

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Considering the continuous industrialization, the waste waters are loaded with heavy metals and because the removal methods are not entirely satisfactory, a new approach is needed. Taking into account the size of the water treatment plants, the production and maintenance cost and the efficiency of treatment, there are certain disadvantages that could disappear with the introduction of a thin mesoporous silica filter. This filter may have a depreciable production price because of its refreshment capability. Mesoporous silica is a form of  $\text{SiO}_2$  with relatively recent use in the field of nanomaterials for environmental protection. Given the hexagonal mesoporous silica arrangement, characterized by a high specific surface, as well as very well defined shapes and dimensions of its pores, the interest in its absorbent and catalytic properties has increased. In this context, mesoporous silica was synthesized by the hydrothermal method. The chemical composition and microstructural properties of the obtained materials were determined by X-Ray Fluorescence (XRF), Electronic Scanning Microscopy (SEM) and X-Ray Diffraction (XRD) analysis. The efficiency of mesoporous silica filters, obtained by powders pressing, to retain heavy metals, was tested on water samples enriched with different amounts of Cu, Ni, Pb, Zn. Filters showed a high adsorption capacity, that goes up to 100% for Pb and Zn and about 70% for Cu and Ni.

**Biography**

Andreea Georgiana Baraitaru is currently pursuing Master's degree from the Politehnica University of Bucharest. He has participated in 2 conferences and in over 10 projects.

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