



Contribution ID : 80

Type : Poster

Adsorptive Removal of the Radionuclides by Granulated Mesoporous Materials

Radioactive compounds leached from radioactive wastes have been considered as widespread contaminants to threaten human health and environment due to their radioactivity in aqueous phase. They are exposed from radioactive waste disposal facility and ubiquitously presented in water. To protect human health and environment, adsorptive removal is one of the most effective technology for separation and purification due to its simplicity and convenience. In this study, granulated mesoporous materials (GMM) are successfully synthesized by using powdered mesoporous materials and organic binders through a one-step and economical granulation approach. Characterization results were obtained by scanning electron microscope, X-ray diffraction, as well as surface and porosity analysis. Also, batch adsorption experiments for removal of radionuclides were carried out to evaluate the adsorption affinity. Adsorption characteristics revealed that GMM showed higher adsorption capacities due to ordered mesoporous structure and excellent physical properties such as BET surface area and pore volume.

Summary

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Track Classification : National and international collaborative waste management programs