Water Free of Lead and Mercury

Al Aqtash, Marwa (School: Al-Hasaad Al-Tarbawi School)
Alshawabkeh, Dima (School: Al-Hasaad Al-Tarbawi School)

In Jordan water shortage is a serious problem that is getting worse because several major water resources became contaminated with heavy metals from industrial waste, like King Talal Dam. This project is a contribution on purifying this contaminated water from heavy metals. In this work we purified contaminated water from heavy metals like lead and mercury using olive stones. An efficient nano co-precipitated magnetic olive biochar was produced to adsorb lead and mercury. The properties of the magnetic olive biochar were characterized by Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FT-IR), and X-Ray Diffraction (XRD). The analyses confirmed the presence of carbon and magnetite and showed a very porous surface for the olive magnetic biochar. A solution of water and lead was prepared with a concentration of a 100ppm. The same concentration was used to prepare a solution of water with mercury. The effect of the biochar in purifying the prepared solutions is evaluated by adding a mass of prepared material to 25 ml of the prepared solution. The dosage effect was evaluated by testing range of 0.05g to 0.50g biochar mass. The results of Atomic Absorption Spectroscopy (AAS) analysis showed that a removal percentage over 99% was achieved for mercury when 0.25g of olive magnetic biochar was used, and approximately the same percentage was achieved for lead when 0.10g of olive magnetic biochar was used. The results of this project showed that the Nano co-precipitated olive magnetic biochar demonstrated a high adsorption capability for both Lead and Mercury from the contaminated water. Our finding from this project could be used in building a purifying system for the contaminated water from heavy metals.

Awards Won: