In this work we studied the kinetics of lead removal in water through hybrid nanostructured material (NZ-MWCNT) based on carbon nanotubes supported on natural zeolite from Valles Centrales, Oaxaca. As a result of pottery activity in the region of Oaxaca Valley, lead used in these activities is considered a worrying problem as water contaminant. In this way the outstanding properties of multi-walled carbon nanotubes (MWCNT) allows their use in removal of metals, moreover if they are combined with a porous materials as zeolite (NZ) results in a hybrid material with accurate properties for contaminant removal. NZ-MWCNT were synthesized by the method of spray pyrolysis, under specific conditions. After NZ-MWCNT were characterized by scanning and transmission electron microscopy (SEM and TEM respectively). In order to obtain the kinetics of removal a solution of Pb was prepared using a concentration of 10 ppm, then NZ-MWCNT were added for remove Pb from water, as with the natural zeolite, later the solution were filtered. The filtrate was analyzed in an inductively coupled plasma mass spectrometry (ICP-MS), to obtain the percentages of Pb removal. The kinetics of Pb removal obtained shows a maximum percentage of 99.96% and 99.27% for NZ-MWCNT and NZ at 120 min, respectively. However, for NZ-MWCNT exhibits 94.5 % of removal only in 10 min, in contrast of NZ which reaches the same percentage in 60 min, this shows a higher efficiency of NZ-MWCNT in Pb removal.

Keywords: Hybrid nanostructured, lead removal, natural zeolite

References: