Egg shell as lead removal material, arsenic and mercury was analyzed by physicochemical and kinetic analysis that helped us to describe the selectivity of removal. The egg shell analyzed the textural properties by BET, morphology by scanning electron microscopy (SEM) and determined the crystalline phase by X-ray diffraction (XRD). After contact of the shell with the aqueous solutions of the metals under study, heavy metals (Lead, arsenic and mercury) were quantified by atomic absorption spectrophotometry (EAA) in the solution obtaining 99, 90 and 85% lead removal, mercury and arsenic respectively; while the shell was analyzed by XPS. On the other hand, the kinetics and sorption isotherms were analyzed by describing an adjustment to the kinetic model of pseud second order and adjusting to the Langmuir isotherm. The results showed that the use of eggshell for the treatment of wastewater that contains metals like arsenic, mercury and lead is an innovative method that constitutes a simple, effective and economical way for water treatment.

**Keywords:** Heavy metals, eggshell, kinetics sorption

**References:**


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