CHAPTER FIVE

CONCLUSIONS

The objective of this work is to find out the appropriate modification process which would enhance the adsorption capacity of Jatropha seed husk for lead from aqueous solution and simultaneously understand the adsorption mechanism of lead onto the surface of modified Jatropha seed husk.

1. The surface area of Jatropha seed husk was increased after modification by H_2SO_4.
2. Equilibrium contact time was achieved after 30 min of Jatropha seed husk modified by 70% H_2SO_4.
3. When the initial concentration of lead was increased from 50 mg/L to 300 mg/L, it was observed that the amount of adsorption, q_e (mg/g) at equilibrium contact times changed from 100 -1000 mg/g.
4. The adsorption data for Jatropha seed husk are well represented by the Langmuir and Freundlich isotherms. The straight lines obtained for the Langmuir and Freundlich isotherm models obey to fit to the experimental equilibrium data, whereas the Langmuir isotherm model gives better fittings than Freundlich isotherm model The value of R_L between 0 and 1.0 further confirms the favorable adsorption of lead.
5. Two kinetic models that are, pseudo-first order and pseudo-second order were used at different initial concentrations and at room temperature to predict adsorption mechanism of lead on Jatropha seed husk modified by 70% H_2SO_4. The pseudo-first order model was not suitable but the pseudo second-order equation provided the best correlation of the experimental data. The pseudo second-order equation is

based on the adsorption capacity on the solid phase and is in agreement with a chemisorption mechanism being the rate controlling step.

From these results, Jatropha seed husk modified by 70% H_2SO_4 can be efficiently used for the removal of Pb(II) from the aqueous solution.