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Sorption Capacity of *Bivalve molluscs* Shell in the Removal of Divalent ION from Aqueous Solutions

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Abstract : Environmental protection emphasizes the use of ecofriendly materials instead of chemicals to minimize pollution. The present work deals with the utilization of acid treated Mussel shell powder, an mollusc shell waste for the adsorption of Pb(II) from aqueous solutions. TMSP is characterized using Scanning Electron Microscopy (SEM), Energy Dispersive X-ray Analysis (EDAX), Brunauer-Emmet-Teller (BET) and Barrett-Joyner-Halenda (BJH) analyses to study the surface morphology, elemental constitution, determination of surface area and pore structures. Batch equilibration studies are verified for the operating factors viz., particle sizes/ doses of the sorbent material upon a range of initial aqueous concentrations of Pb(II) at different temperatures, agitation time and pH of the Pb(II) -TMSP system to assess the sorption capacity which is recorded as 83.6 mg/g implying its efficiency to be three fold times more than the reported values for varied sorbents by other researchers. The applicability of Langmuir and Freundlich isotherms at various initial concentrations are plotted for Pb(II) -TMSP system wherein the best straight line is well fit for Langmuir model indicating monolayer adsorption. Continuous column running for quantitative estimation of Pb(II) removal from the bulk of the solution is carried out by the chosen sorbent.

Keywords: bivalve molluscs shell, adsorption, lead ion, aqueous solution, column.

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