**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(TMSP), an mollusc shell waste for the adsorption of Zn(II) from aqueous solutions. TMSP ischaracterized using Scanning Electron Microscopy (SEM), Energy Dispersive X-ray Analysis (EDAX),

Brunauer-Emmet-Teller (BET) and Barrett-Joyner-Halenda (BJH) analyses to study the presenceof carboxylic, amino/ phenolic/ hydroxyl groups, surface morphology, elemental constitution,determination of surface area and pore structures. Batch equilibration studies are verified for theoperating factors viz., particle sizes/ doses of the sorbent material upon a range of initial aqueousconcentrations of Zn(II) at different temperatures, agitation time and pH of Zn(II) -TMSP system toassess TMSP sorption capacity. The maximum sorption capacity of TMSP is found to be 22.63 mg/gimplying its efficiency to be three fold times more than the reported Ce values for varied sorbentsby other researchers. Continuous column running for Zn(II) removal by TMSP from the bulk ofthe aqueous Zn(II) solution is estimated. The implications of the laboratory results are tested withelectroplating wastewaters collected from the industrial belt in Coimbatore district. Fibre ReinforcedPolymer is fabricated, packed with TMSP with specifications in column packing/flow rate of effluentsand installed at the effluent discharge plants where its performance indicated 100% Zn(II) removal.