**Abstract**

Phosphate ions from various sources viz., fertilizers, agricultural runoff and sewagewastewaters discharged into water bodies either directly or indirectly may causeeutrophication and death of aquatic plants. Efficiencies of *Camellia sinensis* stems (CSS) and*Pistachio vera* hull(PVH) in trapping phosphate ions from aqueous solutions is verifiedthrough Batch Equilibration Method. Excess alkaline nature of CSS & PVH is reduced byneutralization, treating with 0.1N H2SO4 and HCl for 3hours each respectively and thereafterreferred to as TCSSD and TPVHP. Characterization studies of the treated materials are carried out using Optika microscope, FTIR spectrophotometer and SEM/EDAX analyses.Optimization is established under variable operating parameters viz., particle sizes anddosages of the sorbent materials, agitation time between sorbent’s and sorbate species, initialconcentrations and pH of the medium. A judicious comparison between the two studiedsystems viz., PO43- - TCSSD and PO43- - TPVHP registered 99% sorption of the anion with theparticle size of 0.18mm, 250mg dosage, 10mg/L initial concentration and pH 5 but forvariation in agitation time intervals, where TCSSD exhibited maximum sorptive efficiency at9 minutes against TPVHP, which recorded 12 minutes. Experimental data are validated withLangmuir and Freundlich adsorption isotherms, where the best linear fit is registered forFreundlich plot in case of the former and Langmuir plot for the latter. Outcomes of the workprove the employed materials to be promising in confiscating phosphate ions and shall beprogressed towards mitigation of effluents.