

*Appendix*

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## PUBLICATIONS

1. **“Virtual Screening of Treated *Pistachio vera* Shell Powder as a potential sorbent in Sequestering Ubiquitous Divalent Metal Ions from Aqueous Matrices”**  
N.Shyamala Devi, Dr.N.Muthulakshmi Andal and K.Vivithabharathi,  
*Oriental Journal of Chemistry*, 2018, Vol.34, No(1), 352-361.
2. **“Confiscation of Ni (II) from aqueous environs using treated bivalve shells”**  
N.Shyamala Devi, Dr.N.Muthulakshmi Andal, K.Vivithabharathi and Dr.S.Charulatha,  
*Advances in Applied Research* (Article in Press).

## PRESENTATIONS

1. **“Utilization of a Biowaste material in the sorption of Pb(II) ions from aqueous medium”**, International Conference on, *“Water Conservation- Save Blue To Save Green”* - Department of Chemistry, Anna Adarsh College for Women, Chennai, 2015.
2. **“Potential Utilization of Pod Shell in the removal of Pb(II) ions”**, International Seminar on, *“Nuance in Life Sciences”* - Department of Microbiology and Biotechnology, Sri Ganesh College of Arts and Sciences, Salem, 2017.
3. **“Screening of Agro Waste Hull in the Sequestration of Divalent Ions”**, International Conference on, *“Energy”, Environment and Advanced Materials for a Sustainable Future”*- Department of Physics and Chemistry, Kongu Engineering College, Perundurai, Erode, 2017.
4. **“A Study on the Biosorption of Divalent ion using a low-cost Material”**, National, Conference on, *“Innovations in Green Chemistry”* - Department of Chemistry, PSGR Krishnammal College for Women, Coimbatore, 2017.
5. **“Confiscation of Pb(II) from aqueous Environs using Biomaterial”**, International Conference on, *“Advanced Materials for Technological Applications- ICAM 18”* - Department of Chemistry, PSGR Krishnammal College for Women, Coimbatore. 2018.

6. **“Confiscation of Ni(II) using Bivalve shells from aqueous matrices”**, National Conference on, *“Recent Advances in Materials Science and Technology”* - Department of Chemistry, Ethiraj College for Women, Chennai, 2018.
7. **“Effective Utilization of Green Materials in the Eviction of Phosphate Ions: A Comparative study”**, National Conference on, *“Chemistry of Advanced Materials and its Biomedical Applications”*- Department of Chemistry, PSGR Krishnammal College for Women, Coimbatore, 2018.
8. **“Exhaustive Utilization of Modified Marine Squander in Surface assimilation of Ni(II) ions from aqueous medium”**, National Seminar on, *“Innovations in Chemical Sciences and Green Technology”*- Department of Chemistry, PSGR Krishnammal College for Women, Coimbatore, 2018.



## Virtual Screening of Treated *Pistachio vera* Shell Powder as a Potential Sorbent in Sequestering Ubiquitous Divalent Metal Ions from Aqueous Matrices

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### ABSTRACT

Water pollution due to noxious heavy metals such as Hg(II), Cr(VI), Cd(II) and Pb(II) ions etc., has been tremendously focused gaining attention towards social benefit. Increasing concentrations of these metals into the ecosystem constitute a severe health hazard due to their toxicity, accumulation and bio-magnification throughout the food chain. Lead contamination of drinking water is a great threat through varied sources viz., lead pipes, plating units etc. *Pistachio vera* shell (PVS) is a hard layer that surrounds the delicious kernel of the nut. The current work evaluates the feasibility of powdered *Pistachio vera* shell (PVSP) - a biowaste for sequestering Pb(II) ions is treated with 0.1N HCl and 0.1N NaOH to enhance its sorption efficacy (TPVSP). SEM, FTIR and microscopic analyses are recorded for characterising the chosen sorbent. Batch experimental studies are performed to assess the equilibration between the sorbate and the sorbent. The competence of the sorbent material is experimentally verified through various operating factors viz., particle size and dosage of TPVSP, agitation time interval between TPVSP and Pb(II) ions, initial concentrations of Pb(II) ions, pH of the adsorption medium, effects of cations, anions, co-ions and influence of temperatures on Pb(II) – TPVSP system. The residual concentrations of Pb(II) ions from aqueous solutions are analysed using Atomic Absorption Spectrophotometer (Shimadzu-AA-6200). Langmuir and Freundlich models are applied to describe the adsorption capacity. Column studies are conducted to ensure the quantitative estimation of TPVSP in trapping 99% of sorbate species at a dose of 40 mg the flow rate being, 100 ml/10 min. assuring the bulkiness of the material.

**Keywords:** *Pistachio vera* shell, Lead, operating factors, Isotherms.

