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Potential use of *Sargassum cinereum* biomass for removal of Lead: Kinetics, Isotherms, Thermodynamic and Characterization Studies

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The present study is attempt to analyze the biosorption trend of biosorbent *Sargassum cinereum* (Macro algae) biomass, for removal of toxic heavy metal ion Pb (II) from solution as a function of initial metal ion concentration, pH, temperature, sorbent dosage and biomass particle size. The sorption data fitted with various isotherm models and Freundlich model was the best one with correlation coefficient of 0.998. Kinetic study results revealed that the sorption data on Pb (II) with correlation coefficient of 0.995, can best be represented by pseudo second order. The biosorption capacity (q_e) of Pb (II) is 15.409 ± 0.32 mg g⁻¹ on *Sargassum cinereum* biomass. Thermodynamic studies showed that the process is exothermic (ΔH° negative). Free energy change (ΔG°) with positive sign reflected the increasing feasibility and spontaneous nature of the process. The SEM studies showed Pb (II) biosorption on selective grains of the biosorbent. The FTIR spectra indicated bands corresponding to hydroxyl, amide, bounded -OH, bounded -NH, C=O stretching vibrations, S = O and C-S-O bands, from ester sulfonate and -C-O benzene ring stretching groups were involved in the biosorption process. The XRD pattern of the *Sargassum cinereum* was found to be mostly amorphous in nature.

Biography

Dr. Kishore Kumar Kadimpati, achieved Ph.D. from Andhra University in Department of Chemical Engineering, Visakhapatnam, India. He was selected for a prestigious Indian Post Doctoral fellowship (Dr. Kothari PDF) from UGC in 2010, worked in School of Life Sciences, University of Hyderabad, India. He is the life member of APTI and Indian Institute of Chemical Engineers (IICChE). He has published more than 25 research papers in high impacted journals and presented more than 25 research papers in international and national conferences. He is an internationally renowned expert reviewer for Elsevier, Springer, Taylor-Francis journals. Presently, he is the professor with Mallareddy Group of Institutions, in Mallareddy College of Pharmacy, Hyderabad.

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