**Abstract**

Electroplating industries, play a momentous role in the development and growth of numerous metal manufacturing, but also equally pollute the environment through various means. Most of the electroplating industries operated in Coimbatore are reported under Red category list, their main source of pollution being heavy metal leaching into aquatic streams. The present work deals with the sorption of Zn(II) and Cr(VI) being highly prevalent electroplating effluents. The process of biosorption has many attractive features compared to the conventional effluent treatment methods adopted so for. Batch studies are conducted at varying operating factors to assess the best sorption efficiency amongst the chosen cost effective and eco-friendly materials viz., Mussel Shell Powder (MSP), *Prosopis juliflora* Bark (PJB), *Terminalia cattapa* Seed Shell (TCSS) and *Aegle marmeloscorrea* (AMC). Based on the experimental data the Treated Mussel Shell Powder (TMSP) and Treated *Prosopis juliflora* Bark (TPJB) are found to be the best sorbent for Zn(II) and Cr(VI) removal respectively. The scaling up process through column experiments are performed to quantify the efficiency of the fixed sorbents under optimized conditions. The longterm analysis at the laboratory levels, reveal 100% and 92% metal removal for Zn (II) – TMSP and Cr (VI) TPJB systems respectively.