**ABSTRACT**

The present work was carried out to study the efficiency of acid treated fruit shell of Aeglemarmelos (L.) Correa (TAMC), for theadsorption of Zn(II) from aqueous solutions. TAMC was characterized using Fourier Transform Infrared (FTIR), ScanningElectron Microscopy (SEM), Energy Dispersive X-ray Analysis (EDAX) analyses for the presence of functional groups, surfacemorphological changes in the chosen material and occurrence of absorption peak in the metal laden TAMC, respectively. Batchequilibration mode of experiments were carried out to assess the impact of the variable parameters viz., particle sizes and doses ofthe adsorbent material, predetermined time intervals between the sorbent and the sorbate species and pH of the medium. Theoptimized conditions for the maximum removal of Zn2+ ions (91.1%) from1000 mg L-1 initial concentration were 0.18 mm particlesize, 1000 mg adsorbent dose, 10 min agitation time and pH 5.5. The applicability of Langmuir and Freundlich isotherms at variousinitial concentrations were plotted for Zn(II)-TAMC system wherein the best straight line was well suited for Langmuir modelwhich indicated the monolayer adsorption. The maximum sorption capacity of TAMC was 80.45 mg g-1 as calculated from theequilibrium concentration data, which was observed to be substantially greater than the q (adsorption capacity at equilibrium) evalues reported employing different sorbent materials. The results revealed the fruit shell of Aeglemarmelos (L.) Correa as apromising material with excellent metal removal capacity when compared to other sorbent materials (Keywords: Zinc ions, fruitshell, characterization, adsorption, parameters).