**Abstract**

Nano hydroxy apatite -*Azaridachtaindica* nutshell composite material was prepared in,co-precipitation method. The product was characterized by FT-IR and Atomic Force microscopy. The Ni(II) removal capacity of the synthesized novel material is investigated by employing batch mode to verify the sorption efficiency under optimized conditions viz., 11 mg/L initial concentration of Ni(II), 21 minutes agitation time between sorbent and sorbate molecules and 50mg dosage of the nano composite. The results of the experiment registered a significant increase · in the sorption nature of nano hydroxy apatite composite of the chosen nutshell against the chemically modified *Azaridachtaindica* nut shell where 450 mg dosage is employed under similar operating conditions. The successfulness of the nano material in trapping Ni{II) ions is extended to field levels through the assessment of effluents collected from electroplating industry suggesting that nano composited biomass of *Azaridachtaindica* nut shell is an efficient bioaccumulant.