



Adsorptive removal of amoxicillin antibiotic from aqueous solution using Pectin-Tin(IV) molybdosilicate composite cation exchanger

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Abstract: Bio polymer based composite cation exchanger Pectin-Tin(IV) molybdosilicate was synthesized and characterized by different instrumental techniques. Cationic nature of the exchanger was confirmed by pH titration studies using NaOH/NaCl and KOH/KCl systems. The main objective of this study was to remove widely used antibiotic amoxicillin from aqueous solution using the synthesized composite exchanger. Sorption of pharmaceutical pollutant amoxicillin on to the exchanger was confirmed using UV-Vis DR spectroscopy. Kinetic models were best fitted by pseudo-second-order model with high value of R^2 compared to pseudo-first-order. Among the two isotherm used, Langmuir isotherm best fit with a maximum monolayer adsorption capacity of 119.11 mg/g. Mass transfer aspects analysed shows that sorption of amoxicillin is intraparticle diffusion controlled along with some extend of boundary layer control. Amoxicillin sorbed exchanger can be regenerated using 0.5 M NaOH as desorbing agent.

Key Words: Composite exchanger, Pectin, Amoxicillin, Waste water, Sorption kinetics.