



Studies on Batch Adsorption of Gemifloxacin using Hybrid Beads from Biomass

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Abstract: Adsorbents are constantly being explored for better removal of waste from aquatic system to make it cost effective and environmental friendly. Batch adsorption studies were carried out for elimination of gemifloxacin from synthetic aqueous solution by using low cost efficient beads. Beads made from plant materials were characterized using SEM, EDX and FTIR. The parameters like contact time (30-180 min), initial concentration (30–50 mg/L), pH (3–11) and adsorbent dose (0.1–1.0 gm/50 mL) were systematically investigated. Inverse relation found between adsorption percentage and antibiotic concentration in water, whereas direct relation observed between adsorption percentage and adsorbent dosage. Maximum adsorption was found at different pH with different combination bead, pH 5.0 for AWC beads (50% almond shell: 25% walnut shell: 25% chitosan) and pH 7.0 for CAW (50% chitosan: 25% almond shell: 25% walnut shell) and WAC beads (50% walnut shell: 25% almond shell: 25% chitosan). Langmuir adsorption isotherm is well befitting in case of CAW beads whereas Freundlich adsorption for the case of AWC and WAC beads. The adsorption rate follows Lagergren pseudo second order kinetics. On the whole, the results of the study indicate that beads in all the combinations taken in the study are very efficient material for the removal of antibiotics from effluents.

Keywords: Antibiotic, Adsorption, Isotherms, Kinetics, Synthesized beads
