

Influence of the Low Frequency Ultrasound on the Cadmium (II) Biosorption by an Ecofriendly Biocomposite (Extraction Solid Waste of Ammi visnaga / Calcium Alginate): Kinetic Modeling

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Abstract : In the present study, an ecofriendly biocomposite namely calcium alginate immobilized Ammi Visnaga (Khella) extraction waste (SWAV/CA) was prepared by electrostatic extrusion method and used on the cadmium biosorption from aqueous phase with and without the assistance of ultrasound in batch conditions. The influence of low frequency ultrasound (37 and 80 KHz) on the cadmium biosorption kinetics was studied. The obtained results show that the ultrasonic irradiation significantly enhances and improves the efficiency of the cadmium removal. The Pseudo first order, Pseudo-second-order, Intraparticle diffusion, and Elovich models were evaluated using the non-linear curve fitting analysis method. Modeling of kinetic results shows that biosorption process is best described by the pseudo-second order and Elovich, in both the absence and presence of ultrasound.

Keywords : biocomposite, biosorption, cadmium, non-linear analysis, ultrasound

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