

Modification of Synthetic Zeolite Pellets from Lignite Fly Ash B : Treatability Study

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ABSTRACT

The present study examined the use of modified synthetic zeolite pellet (zeolite Na-P1), which were presented and discussed earlier in the previous paper, for the removal of cadmium from aqueous solution. The effects of pH, contact time and initial concentration on the sorption process were examined. The optimum pH was found to be 4.0. For batch study, residual cadmium concentration reached equilibrium in 1500 min and the removal efficiency were more than 98% in all formula of modified zeolite pellet and initial concentration. Langmuir model was fitted to explain the equilibrium of this sorption successfully which the maximum capacity of 3.14 mg/g. while are much lower than other low-cost adsorbents. For column study series application was investigated for the hydraulic loading rate (HLR) at 3.75 and 5.63 m³/(m²-hr) using initial cadmium concentration 6.6 mg/l. of synthetic wastewater. The adsorption capacity of 0.26 and 0.19 mg/g., respectively were obtained by Bohart - Adams model. This showed that the lower HLR or upper bed depth would have higher breakthrough volume due to an increase in empty bed contact time (EBCT) and optimum EBCT in column should not be less than 3.39 min.

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