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Effect of experimental parameters on the interaction of brick particles and phosphate species

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Brick clay particles, among many naturally available substances, show a significantly high removal of metal ions, anions and organic molecules due to the availability of active sites. The interaction of chemical species with brick clay particles, and hence the extent of adsorption, depend on environmental conditions. Consequently, pre-treatment and chemical modification methods could affect the efficiency of the removal process.

This paper summarizes the results of carefully controlled experiments, performed under different experimental conditions, for the investigation of the interaction of brick clay particles, fired at different temperatures with phosphate ions. Variation of stirring time and settling time on the extent of sorption of phosphate ions reveals that 10 min stirring and 60 min settling would be optimum. Among many firing temperatures, brick clay fired at 400 °C provides the most efficient sorption of phosphate ions. At this temperature, it is expected that organic matter present in brick clay would have decomposed exposing more sites for adsorption. Further, concentration dependent experiments conducted at ambient temperature and pH in aqueous medium indicate that both the Langmuir and Freundlich adsorption models are obeyed by this system.

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