

Prussian Blue/Chitosan/Graphene oxide composites for removal of radioactive cesium in water

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An organic-inorganic composite composed of Prussian blue (PB)/Chitosan (CS)/Graphene oxide (GO) has been synthesized and utilized as a potential adsorbent for the removal of cesium ions (Cs^+) from aqueous solution. The effects of adsorbate concentration, reaction pH, and time on the removal efficiency of Cs^+ were investigated. The optimal pH and reaction time for the removal of Cs^+ were identified as pH 7 and 24 h, respectively, with an adsorbent dosage of 20 mg. The adsorption isotherm is better fitted to the Freundlich model than the Langmuir model with a maximum Cs^+ adsorption capacity of 33 mg g⁻¹. In addition, the kinetic study showed that the adsorption behavior followed a pseudo-second-order kinetics. The adsorbent showed good selectivity towards Cs^+ even in the presence of competitive cations having a higher concentration than Cs^+ . From the above results, it is expected that this organic-inorganic composite can be used as a potential adsorbent for the removal of radioactive cesium.