

Effective removal of lead (II) ions by dead calcareous skeletons: sorption performance and influencing factors

ABSTRACT

Dead calcareous skeletons (CSs) as low-cost adsorbents were studied to remove lead ions (Pb (II)) in an aqueous solution. Factors influencing the efficiency of CSs were evaluated by adsorbent size, contact time, initial concentration, dosage concentration and pH. The optimum CS size for removal of Pb (II) was 710 μm at an equilibrium time of 720 min. The best dosage of CS was 10 g/L for a 99% removal efficiency without pH adjustment. Pb (II) ions were effectively removed in the initial pH of the metal solution. CS was able to remove a high concentration (100 mg/L) of Pb (II) at a removal efficiency of 99.92% and at an adsorption capacity of 13.06 mg/g. Our results demonstrated the potential of CS as a metal adsorbent in the aqueous phase with a high-removal efficiency and distinct physical characteristics.

Keyword: Lead (II) ions; Dead calcareous skeletons; Sorption performance