



Sustainable use of autoclaved aerated concrete waste to remove low concentration of Cd (II) ions in wastewater

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ABSTRACT

As an industrial byproduct, autoclaved aerated concrete waste (AACW) was used as an efficient and economic adsorbent for Cd (II) removal in wastewater. The structure and physical properties of AACW were characterized by XRF, SEM, XRD and its adsorption properties for removal of 3 mg/L Cd (II) under different conditions were also investigated. The results showed that the removal rate of AACW for Cd (II) has attained 97% after 90 min when the initial dosage of AACW was 10 g/L. The adsorption process was fitted to Langmuir model and pseudo-second-order kinetic model. Physisorption and chemisorption were both observed during the process. Besides, AACW possesses comprehensive removal effects for other heavy metal ions in industrial wastewater. The adsorption of Cd (II) ion was affected by other metal ions and different ions in the solution showed different inhibitory effects. Taken together, the AACW recycled from the construction process could serve as a promising adsorbent for toxic metals remediation from aqueous solution.

Keywords: Autoclaved aerated concrete; Industrial wastes; Cd (II); Adsorption; Chemisorption

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