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On the importance of surface chemistry and composition of Bone char for the sorption of heavy metals from aqueous solution

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ABSTRACT

This paper reports new insights on the role of the inorganic composition of Bone char (BC) on its sorption properties for the removal of heavy metals Cd^{2+}, Ni^{2+}, and Zn^{2+} ions from aqueous solution. In particular, we showed the importance of both composition and surface chemistry of BC on its sorption properties for the removal of these metal ions in aqueous solution. Results of physicochemical characterization and sorption studies suggest that the inorganic phase of BC may contribute from 60 to 92% of the sorption process of heavy metals in aqueous solution. In particular, the ion exchange process of Ca^{2+} involving the hydroxyapatite has an important contribution in heavy metal removal using bone char. BC is an outstanding sorbent for the removal of Ni^{2+} ions and appears to be suitable for water purification systems.

Keywords: Bone char; Heavy metals; Water treatment; Sorption; Surface chemistry

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