Adsorptive separation of boron from aqueous solution using cross-linked chitosan based materials

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This study aims to develop a crosslinked chitosan functionalized with humic acid to remove boron from aqueous solution. Boron has an ecotoxicity, which stunts plant growth at a concentration greater than 5 ppm. Among several methods to remove boron, adsorption using an ion exchange resin has shown advantages such as its higher specificity, availability at low concentration of boron and regenerable capacity. Crosslinked chitosan (CCTS) based adsorbent which has amine group protected during crosslinking was functionalized with humic acid (HA) to contain carboxylic and phenyl groups. The CCTS-HA was tested with 10 ppm of boron containing solution according to various pH, reaction time. As a result, the CCTS-HA showed a feasibility to use as an environmentally friendly and cost effective boron adsorbent which might formed chelating bond with boric ion in aqueous solution.