Mercury removal from drinking water by single iron and binary iron-manganese oxyhydroxides

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\begin{abstract}
In this study, single iron oxyhydroxides (FeOOH) and binary iron/manganese (FeMnOOH) oxyhydroxides were used to serve as potential mercury adsorbents. The selection of the optimum adsorbent and the corresponding conditions of the synthesis was based not only on its maximum Hg(II) adsorption capacity but also on its ability to achieve the mercury health regulation limit for drinking water in National Sanitation Foundation challenge water matrix. The experimental results revealed improved adsorption capacity for Hg by the FeMnOOH compared to FeOOH. In addition, the synthesis parameters of FeMnOOH, pH, and redox showed a significant influence on Hg removal efficiency. High redox values and mild alkaline pH improve mercury removal capacity of binary ferric manganese oxyhydroxides.

Keywords: Mercury removal; Ferric-manganese oxyhydroxides; Adsorption; Kinetic; Surface charge
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