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Chromate removal by surface-modified nanoscale zero-valent iron: Effect of different surface coatings and water chemistry

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Abstract

This study investigated the correlation between the colloidal stability and reactivity of surface-modified nano zero-valent iron (SM-nZVI) as affected by the surface coating (i.e., polyacrylic acid [PAA] and starch) under various geochemical conditions. Generally, the colloidal stability of nZVI was enhanced with increasing loading of surface coating, while there is an optimum loading for the most efficient Cr(VI) removal by SM-nZVI. At lower loadings than the optimum loading, the surface coating could enhance the particle stabilization, facilitating the Cr(VI) reduction by providing more available surface sites. However, the over-loaded surface coating on the surface of nZVI particles decreased the Cr(VI) reduction due to the occupation of

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