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Front Cover Story (see: Shuchang Wang, Binbin Shao, Junlian Qiao, Xiaohong Guan, 2021, 15(5): 80)

The past two decades have witnessed the rapid development and wide application of Fe(VI) in the field of water de-contamination because of its environmentally benign character. Fe(VI) has been mainly applied as a highly efficient oxidant/disinfectant for the selective elimination of contaminants. The in situ generated iron(III) (hydr)oxides with the function of adsorption/coagulation can further increase the removal of contaminants by Fe(VI) in some cases. Because of the limitations of Fe(VI) per se, various modified methods have been developed to improve the performance of Fe(VI) oxidation technology. Based on the published literature, this paper summarized the current views on the intrinsic properties of Fe(VI) with the emphasis on the self-decay mechanism of Fe(VI). The applications of Fe(VI) as a sole oxidant for decomposing organic contaminants rich in electron-donating moieties, as a bi-functional reagent (both oxidant and coagulant) for eliminating some special contaminants, and as a disinfectant for inactivating microorganisms were systematically summarized. Moreover, the difficulties in synthesizing and preserving Fe(VI), which limits the large-scale application of Fe(VI), and the potential formation of toxic byproducts during Fe(VI) application were presented. This paper also systematically reviewed the important nodes in developing methods to improve the performance of Fe(VI) as oxidant or disinfectant in the past two decades, and proposed the future research needs for the development of Fe(VI) technologies.

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of Fe(VI) oxidation technology



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