



Ferrate(VI): In situ generation and water treatment – A review

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Received 9 August 2010; accepted 30 January 2011

ABSTRACT

Over the past few years, the higher oxidation states of iron (ferrate, Fe(VI)) are of interest because of their involvement in reactions of environmental, industrial, and biological importance. New ferrate chemistry is still being developed and new analytical techniques are used to characterise the ferrate species. Applications of ferrate to treat common pollutants and emerging contaminants such as arsenic, estrogens, pharmaceuticals, and personal-care products are being explored. Ferrate is emerging as a green chemical for organic synthesis and for treating toxins in water. This review paper aims to discuss the potential of generating ferrate(VI) *in situ* and using it for water treatment. The first part provides a short review of recent advances in Fe(VI) synthesis and introduces its *in situ* electrochemical synthesis. The second part is devoted to application of Fe(VI) in the treatment of water as an oxidant, disinfectant and coagulant. Since iron is required as a growth factor by humans, normally innocuous to the environment with no by-products dangerous to human and environmental health, and less toxic than aluminium, ferrate(VI) may be considered as a green chemical for water treatment.

Keywords: Ferrate(VI); Water treatment; Electrochemical method; Oxidation; Disinfection; Coagulation

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