



Wastewater treatment via electrochemically generated ferrate and commercial ferrate

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ABSTRACT

This paper presents the results of wastewater treatment using electrochemically generated ferrate and commercial potassium ferrate (supplied by Sigma–Aldrich). Two electrolytes were used for the electrochemical generation of ferrate; NaOH at 8.0, 10.0, and 12.0 M and KOH at 12.0 M, the ferrate solutions produced were used for the treatment of wastewater samples from a wastewater treatment plant. The experimental results of removal of organic matter in wastewater by electrochemically generated and by commercial ferrates were measured. In this work, the pH, chemical oxygen demand, and turbidity were determined for the treatment of wastewater using ferrate from different source. Experimental results revealed that the treatment with electrochemically generated ferrate was more efficient than the treatment with commercial ferrate. The commercial ferrate was found to be chemically unstable when dissolved in water prior to its application on wastewater treatment. The concentrations of potassium and sodium ferrate electro-generated were determined with a UV–visible spectrophotometer throughout this work.

Keywords: Ferrate; Electrochemical generation; Wastewater; Water treatment; Electrolyte; Coagulation

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