Short Communication

Bipolar Electrochemical Reactor Processes for Removal of Bacterial Spores: Effect of Ethanol and Potassium Iodide

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Electrochemical techniques have a great potential in removing organic matters and resistant microorganisms from water through water treatment processes. The present study was conducted to propose a standard solution for the removal of *Bacillus subtilis* as a model of *Cryptosporidium* from drinking water using a bipolar electrochemical system. The initial number of *Bacillus subtilis* spores used as a *Cryptosporidium* surrogate for water quality assessment was 10^2 - 10^4 spores/mL. The electrochemical reaction took 15 to 60 minutes to complete and occurred in the presence of 0.4 M of ethanol and 4 mg/L of KI and at a current density of 3-5 mA/cm², at ambient temperature and with normal pH water. The findings suggest that, under optimal conditions of *Bacillus subtilis* spore removal, the synergistic effects of bipolar electrochemical reactions in the presence of KI and ethanol lead to a 32% reduction in energy consumption compared to when only a single electrochemical process is used.

Keywords: Bipolar electrochemical reaction, ethanol, supporting electrolyte, *Bacillus subtilis* spores, water disinfection

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