

Evaluation of Electrochemically Generated Potable Water Disinfectants for Use on the International Space Station

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Microbial contamination and subsequent growth in spacecraft water systems are constant concerns for missions involving human crews. The current potable water disinfectant for the International Space Station (ISS) is iodine; however, with the end of the Space Shuttle program, there is a need to develop redundant biocide systems that do not require regular up-mass dependencies. Throughout the course of a year, four different electrochemical systems were investigated as a possible biocide for potable water on the ISS. Research has indicated that there is a wide variability with regards to efficacy in both concentration and exposure time of these disinfectants, therefore baseline efficacy values were established. This paper describes a series of tests performed in order to establish optimal concentrations and exposure times for four disinfectants against single and mixed species planktonic and biofilm bacteria. Results of the testing determined whether these electrochemical disinfection systems are able to produce a sufficient amount of chemical in both concentration and volume to act as a biocide for potable water on ISS.