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INVESTIGATION ON THE ELECTRO-CATALYTIC OXIDATION AND PHOTO-CATALYTIC
OXIDATION OF HYGIENIC WASTEWATER FOR LONG-TERM SPACE FLIGHTS

Abstract

As space missions grew longer, the hygienic water reclamation became a subject of acute concern. Though various crew hygienic systems have been tested and updated to provide water management procedures for long-term space flights to date, further mass and energy reduction hygienic water reclamation techniques are still needed for the life support systems. Efficiency of hygienic water degradation by electro-catalytic oxidation and photo-catalytic oxidation under different technological parameters were investigated in this paper. Due to the diversity of the organic compounds in hygienic water, waste water with various organic compounds compositions was tested. In addition, the components of the degradation products under different conditions were characterized quantitatively. The influence of technological parameters on the removal efficiency and the products types were analyzed. Finally, the efficiency and availability of hygienic water treatment by electro-catalytic oxidation in comparison with that by photo-catalytic oxidation was summarized.