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STUDY ON THE TECHNIQUE OF SIMULATED SPACE WASTEWATER TREATMENT WITH A BIOREACTOR

Abstract

Objective To select suitable technologic parameters for the membrane bioreactor that will used to dispose space wastewater. Method In order to improve the efficiency of oxygen utilization in waste water disposal by microorganisms, a membrane bioreactor was fabricated, which possessed hollow fiber foamless oxygen supply technique. Then, the reactor was used to study the ground stimulation of waste-water disposal. The reactor consisted of seven components, including aerobic reaction room, anaerobic reaction room, foamless oxygen-supply room, clear water collection room, waste gas separation room and so on, which are completely isolated and independent. Oxygen provision and clean water collection in the aerobic reacting tank are separately accomplished by means of a hydrophilic tubular membrane unit and a hydrophobic tubular membrane unit, and their working principles meet the needs of space microgravity condition. Result Series of experiments for different effects of temperature, electronic conductivity, pH and hydraulic retention times on the microbial wastewater biodegradation were carried out. By comparing the content of COD, BOD, TOC, TN of the water inlet with the outlet, the parameters of the reactor were optimized. The conditions are pH 6.5 7.5, temperature 24.0 26.0, hydraulic remain time (HRT) 20.0hrs, the ratio of C/N 0.81, in which the degradation of COD and BOD of stimulated space waste water could reach close to 90 percent. Conclusion The membrane bioreactor could dispose the simulate space wastewater effectively. The suitable technologic parameters could improve the quality of water from the bioreactor. Key words: membrane bioreactor, foamless oxygen supply, stimulated space wastewater, controlled ecological life support system, biodegradation