

Effluent Therapy of Electroplating Industry using Hybrid Up Flow Anaerobic Sludge Blanket Coupled with Dual Chambered Microbial Fuel Cell

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ABSTRACT

In the present study, the treatment of electroplating industry wastewater is done by coupled approach of hybrid upflow anaerobic sludge blanket (HUASB) with dual chambered microbial fuel cell (DMFC). A laboratory scale anaerobic treatment was conducted in HUASB at an organic loading rates (OLR) was found to be 0.28 to 11.38 kg COD/m³/d over a period of 290 days. The optimum OLR of the anaerobic reactor was found to be 6.83 kg COD/m³/d, and the corresponding chemical and biochemical oxygen demand (COD and BOD) removal efficiency obtained were 88% and 90%, respectively. A maximum biogas production of 12.5 L/d was achieved. The effluent from the HUASB was further treated through DMFC technology. At the optimized conditions, DMFC treatment was achieved COD and BOD removal efficiency of 85% and 89%, respectively. The maximum voltage of 590 mV and corresponding power density of 98mW/m² was achieved while treating the electroplating industry wastewater. The maximum values of COD and BOD removal efficiency achieved was 98% and 99% respectively, for the coupled treatment system.

Keywords: *Electroplating industry wastewater, HUASB, DMFC, COD, BOD*