

A Study of Anoxic - Oxic Microbiological Technology for Treatment of Heavy Oily Refinery Wastewater

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Abstract : Heavy oily refinery wastewater with the characteristics of high concentration of toxic organic pollutant, poor biodegradability and complicated dissolved recalcitrant compounds is intractable to be degraded. In order to reduce the concentrations of COD and total nitrogen pollutants which are the major pollutants in heavy oily refinery wastewater, the Anoxic - Oxic microbiological technology relies mainly on anaerobic microbial reactor which works with methanogenic archaea mainly that can convert organic pollutants to methane gas, and supplemented by aerobic treatment. The results of continuous operation for 2 months with a hydraulic retention time (HRT) of 60h showed that, the COD concentration from influent water of anaerobic reactor and effluent water from aerobic reactor were 547.8mg/L and 93.85mg/L, respectively. The total removal rate of COD was up to 84.9%. Compared with the 46.71mg/L of total nitrogen pollutants in influent water of anaerobic reactor, the concentration of effluent water of aerobic reactor decreased to 14.11mg/L. In addition, the average removal rate of total nitrogen pollutants reached as high as 69.8%. Based on the data displayed, Anoxic - Oxic microbial technology shows a great potential to dispose heavy oil sewage in energy saving and high-efficiency of biodegradation.

Keywords : anoxic - oxic microbiological technology, COD, heavy oily refinery wastewater, total nitrogen pollutant

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