

BIOLOGICAL TREATMENT OF OILY WASTEWATER FROM GAS STATIONS BY MEMBRANE BIOREACTOR

P.T. Tri¹, C. Visvanathan¹ and V. Jegatheesan²

¹Environmental Engineering and Management Program, School of Environment, Resources and Development, Asian Institute of Technology, Pathumthani, 12120 Thailand

²School of Engineering, James Cook University, Townsville, QLD 4811, Australia

Corresponding Author: C. Visvanathan, Environmental Engineering and Management Program, School of Environment, Resources and Development, Asian Institute of Technology, Pathumthani, 12120 Thailand, Tel : (+66) 2 524 5640 Fax: (+66) 2 524 5625 Email: visu@ait.ac.th

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ABSTRACT

In many Asian countries, rapid industrialization and urbanization has led to an increased number of cars, making wastewater from gas stations an important issue of concern in urban environment. This wastewater is characterized by high concentration of oil/water emulsion, which cannot be effectively removed by conventional gravity separator. An experimental investigation on the treatability of oily wastewater from gas stations using a membrane bioreactor (MBR) system revealed that MBR system could achieve good removal efficiency with stability against shock loading. Optimum operating conditions were found to be at a hydraulic retention time of 4 hours and an oil-loading rate of 1.8 kg oil/m³.d. It was anticipated that adding powdered activated carbon (PAC) in the MBR could help to adsorb the oils. However, operating the MBR with only microbial flocs has an advantage over adding PAC particles into the MBR since the former condition could provide prolonged cycle of filtration with relatively lesser increase in transmembrane pressure.

KEYWORDS

Activated sludge process, membrane bioreactor, membrane fouling, oily wastewater, powdered activated carbon, transmembrane pressure.