

The Relationship between Operating Condition and Sludge Wasting of an Aerobic Suspension-Sequencing Batch Reactor (ASSBR) Treating Phenolic Wastewater

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Abstract : Petroleum refinery wastewater (PRW) can be considered as one of the most significant source of aquatic environmental pollution. It consists of oil and grease along with many other toxic organic pollutants. In recent years, a new technique was implemented using different types of membranes and sequencing batch reactors (SBRs) to treat PRW. SBR is a fill and draw type sludge system which operates in time instead of space. Many researchers have optimised SBRs' operating conditions to obtain maximum removal of undesired wastewater pollutants. It has gained more importance mainly because of its essential flexibility in cycle time. It can handle shock loads, requires less area for operation and easy to operate. However, bulking sludge or discharging floating or settled sludge during the draw or decant phase with some SBR configurations are still one of the problems of SBR system. The main aim of this study is to develop and innovative design for the SBR optimising the process variables to result is a more robust and efficient process. Several experimental tests will be developed to determine the removal percentages of chemical oxygen demand (COD), Phenol and nitrogen compounds from synthetic PRW. Furthermore, the dissolved oxygen (DO), pH and oxidation-reduction potential (ORP) of the SBR system will be monitored online to ensure a good environment for the microorganisms to biodegrade the organic matter effectively.

Keywords : petroleum refinery wastewater, sequencing batch reactor, hydraulic retention time, Phenol, COD, mixed liquor suspended solids (MLSS)

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