

Simulation (BSM1-P) Studies on Oxygen Concentration with Variable Flowrates in Aeration Tank of Biological Wastewater Treatment Plant

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Abstract

Water is an indispensable for all forms of survival. Domestic waste water also holds nutrients, which can revive the growth of marine life and may contain hazardous blends [1]. Owing to these reasons, fast menace removal from wastewater at its source of inception and followed by treatment reuse and recycle. Aeration is classified among the methods which help in the elimination of miscellaneous contaminates in the waste water. In aeration system Dissolved oxygen (DO) is pondered to be the most important effluent quality variable at which aquatic life survive [2]. The two most usual category of aeration systems are diffuse and surface aerators. Nevertheless, each has drawbacks and benefits that make an apt option based on their feature. In essence, it is to supply adequate oxygen that one may satisfy the respiratory stipulation of the microbic biomass and to perpetuate this biomass in suspension [3]. Aeration and blending in the aeration tank is usually attained by using mechanical aeration along with the surface aerators either a vertical or horizontal or by air diffusion. In this present work, the effluent quality, energy and cost from different aeration processes is studied by considering activated sludge models (ASM2d). Simulation studies are carried out on various aeration processes using the waste water treatment simulation tool (GPS-X). Simulation is carried out under steady state in diffused air system of various bubbling pattern and it was found that jet bubble having a more effluent quality but not much cost effective while compared to other patterns. Moreover, DO controller in diffused air system has better effluent quality in comparison with surface aerator system. Estimated cost and energy of Diffused air system is far superior than surface aeration system in ASM2d

Keywords - Dissolved Oxygen, Activated sludge model (ASM2D), Aeration system, Biological Wastewater Treatment.

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