Title: Use of Glycerol/Biodiesel Waste via Prefermentation for Enhanced Biological Phosphorus Removal in Advanced Wastewater Treatment

This study investigated the effect of adding glycerol/biodiesel waste (as an external carbon source) into a bench-scale side stream prefermenter for volatile fatty acids (VFAs) production. VFAs are known as the most suitable carbon sources to drive phosphorus removal in enhanced biological phosphorus removal (EBPR) systems. For this reason environmental and operational conditions namely glycerol/biodiesel waste initial dosage, pH, temperature, solids retention time and mixing intensity were evaluated to increase the fermentation process efficiency. Mixing energy had by far the greatest impact with low mixing intensity increasing VFA production. It was also observed that acidic pHs (e.g., pH=5) were consistently inhibitory to VFA production. In addition, the potential of using pure glycerol in the EBPR process was studied by determining the best location for adding glycerol in a continuous flow activated sludge system treating real wastewater but that prefermenting the glycerol might resulted in a lower effluent P concentration.

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Approved for distribution by Dr. Andrew A. Randall, Committee Chair, on November 30, 1999.

The public is welcome to attend.