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A Combined Activated Sludge-Sonication Process for Abattoir Wastewater Treatment

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Abstract : Wastewater treatment is becoming a worldwide concern due to new and tighter environmental regulations, and the increasing need for fresh water for the exponentially growing population. The meat industry has one of the highest consumption of water producing up to 10 times more polluted (BOD) wastewaters in comparison to domestic sewage. Therefore, suitable wastewater treatment methods are required to ensure the wastewater quality meet regulations before discharge. In the present study, a combined lab scale activated sludge-sonication system was used to treat pre-treated abattoir wastewater. A hydraulic retention time of 24 hours and a solid retention time of 13 days were used for the activated sludge process and using ultrasound as tertiary treatment. Different ultrasonic frequencies, powers and sonication times were applied to the samples and results were analysed for chemical oxygen demand (COD), biological oxygen demand (BOD), total suspended solids, pH, total coliforms and total viable counts. Additionally, both mechanical and chemical effects of ultrasound were quantified for organic matter removal (COD and BOD) and disinfection (microorganism inactivation) using different techniques such as aluminum foil pitting, flow cytometry, and KI dosimetry.

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