

Organic Matter Removal in Urban and Agroindustry Wastewater by Chemical Precipitation Process

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Abstract : The impacts caused by anthropogenic actions on the water environment have been one of the main challenges of modern society. Population growth, added to water scarcity and climate change, points to a need to increase the resilience of production systems to increase efficiency regarding the management of wastewater generated in the different processes. Based on this context, the study developed under the NETA project (New Strategies in Wastewater Treatment) aimed to evaluate the efficiency of the Chemical Precipitation Process (CPP), using the hydrated lime ($\text{Ca}(\text{OH})_2$) as a reagent in wastewater from the agroindustry sector, namely swine wastewater, slaughterhouse and urban wastewater, in order to make the productive means 100% circular, causing a direct positive impact on the environment. The purpose of CPP is to innovate in the field of effluent treatment technologies, as it allows rapid application and is economically profitable. In summary, the study was divided into four main stages: 1) Application of the reagent in a single step, raising the pH to 12.5 2) Obtaining sludge and treated effluent. 3) Natural neutralization of the effluent through Carbonation using atmospheric CO_2 . 4) Characterization and evaluation of the feasibility of the chemical precipitation technique in the treatment of different wastewaters through the technique of determining the chemical oxygen demand (COD) and other supporting physical-chemical parameters. The results showed an approximate average removal efficiency above 80% for all effluents, highlighting the swine effluent with 90% removal, followed by urban effluent with 88% and slaughterhouse with 81% on average. Significant improvement was also obtained with regard to color and odor removal after Carbonation to pH 8.00.

Keywords : agroindustry wastewater, urban wastewater, natural carbonatation, chemical precipitation technique

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