

## EFFECT ON ANAEROBIC DEGRADATION OF ORGANIC MATTER AFTER THICKENING PROCESS

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### ABSTRACT

The objective of this research work presented in this paper is to study the effect of thickening on anaerobic degradation of organic matter. The stability is illustrated in terms of the performance of the methanogenic activity along the experimental period as well as the maximum reduction of organics pollutants inherent in the experimented sludge samples.

The experimental work was conducted in a batch processing system under temperatures (40, 45, 50 °C) to stimulate the optimum conditions of the degradation process. The experiments have continued until the gas production has ceased. The results show a reduction efficiency of 79.8% of COD, 95.5% of BOD and 85.9% of TS within about 58 days at 40 °C. Measured increase of reduction was obtained with the increase of operating temperature up to 50 °C. In addition, the study approved the independency of complete digestion period on the operating temperature. The study assures that the COD/BOD ratio has increased strongly indicating production of high quality digested sludge. Also, the specific methanogenic activity, SMA, is increasing with temperature. The experiments measured the parameter of M factor which presents the percentage of the removed COD that is converted into methane gas, accordingly, the M factor express the actual digestion performance of organic matter. The experimental results revealed that the M factor was almost the same for all temperature range explaining the main obstacle of anaerobic digestion of domestic sludge.

**KEYWORDS:** Sludge Stabilization; Thickening Effect; COD Balance; Sludge Stability; Anaerobic Digestion; Methane Production; Organic Matter; Complete Treatment