



## EVALUATION OF BIOGAS PRODUCTION UNDER NO CONTROLLED TEMPERATURE CONDITIONS IN A UASB REACTOR WITH FEEDING OF SLAUGHTERHOUSE WASTEWATER

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**Introduction.** Currently seeking alternative energy sources, to reduce the use of fossil fuels, a good choice is the biogas, which can be generated from the anaerobic digestion of organic matter knowledge used to treat wastewater with high contents organic loading such as slaughterhouse [1].

A process anaerobic UASB reactor is used, which in its operating stage biogas produced allowing energy recovery, this process is linked to the internal reactor temperature [2]. It is for it that the main is to analyze the operation of a pilot scale reactor temperature controlled to treat slaughterhouse wastewater.

**Methods.** Profiles were performed 24 hours of internal reactor temperature, environment temperature and biogas production once a month, and control parameters were evaluated as alkalinity, pH, alpha ratio, and organic load removal, based on Mexican standards and corresponding Hach method for the determination of COD.

The temperature data were obtained from the meteorological station located CONAGUA in Morelia, Michoacán.

**Results.** Biogas production was monitored for 24 and 48 h after loading the reactor in order to meet production during the first 48 h hydraulic residence time established.

The minimal biogas production at 24 hours of the charge was 1.6 m<sup>3</sup>/d while at 48 hours with the same load was of the order of 1.08 m<sup>3</sup>/d.

The maximum production of biogas was 3.675 m<sup>3</sup> estimated for the month of February 2012, which is attributed to the organic load of wastewater was high.

During the month of October of 2011 to November of 2012 the minimum temperature which was presented in December 2011 which was 5.6 °C, while the highest temperature recorded was 28 °C in April 2012.

The environment temperature has a similar behavior over 14 months in which monitoring

begins at a low temperature is around 5.5 °C for the coldest months and 15 °C for the hot months which increases to throughout the day with peaks between 13 and 15 hours a day from this point the temperature begins to decrease.

The temperature profiles of the reactor just as the environment temperature following the same behavior, so that the temperature of the medium may have influence on the UASB, however the temperature peaks do not occur at the same times inside the reactor reached the highest temperatures are recorded between 17 and 19 hours a day which means that there is a shift in temperature.

The temperature inside the reactor did not reach the minimum temperatures that occurred in the environment in the cooler hours of the day inside the reactor was about 19 °C.

The variations of the pH, alkalinity, alpha ratio and organic load, were negligible along of the evaluation.

**Conclusions.** The maximum temperature within the reactor is displaced 4 hours while the minimum temperature never becomes so low as in the environment.

Other variables did not show significant influence in the biogas production, the temperature is the variable whose effect is important, and can improve the generation of biogas, maintaining a constant temperature mesophilic range, this shows that necessary to control the internal temperature reactor.

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