ANAEROBIC CHARACTERIZATION AND DEGRADATION OF LEACHATES PROCEEDED FROM URBAN SOLID WASTE FROM THE EX DUMPING GROUND NEZA 1

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Key words: Leachates, characterization, sodium, UASB

Introduction. Historically dumping grounds or sanitarium landfill sites have been the most economical and environmentally acceptable method for solid waste evacuation in the world. Nevertheless, the relatively facility of implementation of these, presents a series of difficulties that day by day limit their appliance, some remarkable ones are, health and environment impacts related to gas escape in noticeable quantities that come from dangerous materials, the non-controlled egress of the leachates being a highly contaminating liquid etc. In different studies, the leachate has been treated anaerobicly and recirculated to the landfill site obtaining a process acceleration of the waste degradation.

The leachate coming from the ex dumping ground NEZA 1, are treated in anaerobic reactors and the effluent is used to recirculate it to the landfill site with the purpose of accelerating the anaerobic degradation of the remaining solid waste. However, there is a lack of information to tell if the goal is being achieved, owing mainly the unawareness of the physical-chemical characteristics of these leachates and a good tracking of the reactors. So, the objective of this work project was to evaluate the characterization of the leachates and the degradation of the organic matter in a UASB reactor.

Methods. The characterization of some physical chemical parameters, such as SST, SSF, SSV, pH, COD, ammonium, alkalinity, and conductivity was performed based on the standard methods (APHA, 2005). For the degradation of the organic matter a UASB of 2.4L was used, with two timings of hydraulic retention. The parameters evaluated in the reactor were: pH, COD, alkalinity and biogas production. (2)

Results. The table 1 Presents the results of the characterisation of the leachates. It can be observed that some parameters or and composites such as pH, Na and conductivity can inhibit the methanogenesis plus, the low concentrations of AGV classifies this leachate as and old leachate.

Figure 1, shows the removal of the organic matter from the leachates in the reactor with two TRH (24 and 48 hours). One day of TRH and a concentration of 1.4 g/L of COD, the efficiency of the removal was null. At 0.5 g DCOD/L with the same TRH the efficiency of DQO removal increased to 25%, with a biogas production of 29 mL/D.

TABLE 1. Characterization of leachate

CHARACTERIZATION OF LEACHATE	
pH	8.8 ± 2
Conductivity	52.6mS/cm ± 2.5
COD	3.9gDQO/L ± 0.3
Ammonium	0.14g/L
SST	1.22g/L
SSF	0.84g/L
SSV	0.38g/L
Na	9.6g/L
AGV	1g/L

To increase the efficiency of organic matter removal the TRH was increased to 48 hours, however the efficiency decreased to 15% , showing that a very stabilized leachate is owned, and the high value of conductivity can be attached to the high sodium concentration that can be inhibitory for the methanogenesis.

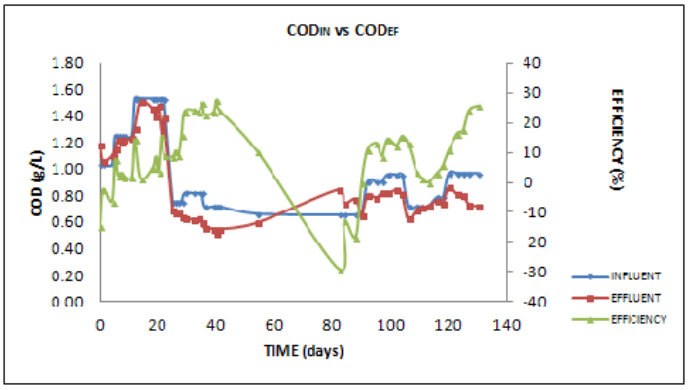

Fig. 1. COD removal of leachate and UASB reactor efficiency

Conclusions. The low efficiency of organic matter removal from the leachate and the low methan production, could be due to the high sodium concentration, inhibitory composite of the metanogenesis, consequently it would be interesting to evaluate a physical chemical process.

Acknowledgements. We appreciate the support provided by UAM-I , COMECyT and ICyTDF.

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