

POSTER SUMMARY

**USE OF AN UPFLOW ANAEROBIC SLUDGE BLANKET REACTOR
FOR ANAEROBIC DIGESTION OF DISTILLERY EFFLUENT**

ZIZHOU N

*Sugar Milling Research Institute NPC, c/o University of KwaZulu-Natal, Durban, 4041, South Africa
nzizhou@smri.org*

Abstract

A laboratory-scale upflow anaerobic sludge blanket (UASB) reactor was used to treat very high strength ethanol distillery vinasse both to reduce the chemical oxygen demand (COD) and to generate methane-rich biogas as a source of energy. The UASB reactor was seeded with granular sludge obtained from a brewery effluent plant. The reactor temperature was maintained at 36°C and vinasse was fed into the reactor undiluted or after diluting. Vinasse COD and total phenolics concentration were more than 100 000 mg/L and 8000 mg/L, respectively. The maximum COD and phenolics abatement rates were 67% and 49% respectively, when the vinasse was diluted and appeared greater than 70% when vinasse was undiluted. Maximum biogas yield was between 0.3-0.5 L/g COD in both cases. These results were obtained for organic loading rates of 6 g COD/L.d for diluted vinasse and 4 g COD/L.d for undiluted vinasse. This study showed that the UASB could be used to reduce the COD and phenolic concentrations of high strength distillery vinasse and simultaneously produce biogas. The study highlighted the level of organic loading rates possible in a UASB system which can be used to design full-scale systems as well as the characteristics of the distillery effluent obtained from the ethanol distillation using South African molasses.

Keywords: anaerobic, biogas, chemical oxygen demand, effluent, phenolics, UASB, vinasse