

High Rate Bio-Methane Generation from Petrochemical Wastewater Using Improved CSTR

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Abstract : The effect of gradual increase in organic loading rate (OLR) and temperature on biomethanation from petrochemical wastewater treatment was investigated using CSTR. The digester performance was measured at hydraulic retention time (HRT) of 4 to 2d, and start up procedure of the reactor was monitored for 60 days via chemical oxygen demand (COD) removal, biogas and methane production. By enhancing the temperature from 30 to 55 °C Thermophilic condition was attained, and pH was adjusted at 7 ± 0.5 during the experiment. Supreme COD removal competence was $98 \pm 0.5\%$ ($r = 0.84$) at an OLR of 7.5 g-COD/Ld and 4d HRT. Biogas and methane yield were logged to an extreme of 0.80 L/g-CODremoved d ($r = 0.81$), 0.60 L/g-CODremoved d ($r = 0.83$), and mean methane content of biogas was 65.49%. The full acclimatization was established at 55 °C with high COD removal efficiency and biogas production. An OLR of 7.5 g-COD/L d and HRT of 4 days were apposite for petrochemical wastewater treatment.

Keywords : anaerobic digestion, petrochemical wastewater, CSTR, methane

Conference Title : ICWRRED 2015 : International Conference on Water Resources and Renewable Energy Development

Conference Location : Istanbul, Turkey

Conference Dates : January 25-26, 2016