

## Brewery Wastewater

Brewery wastewater was efficiently treated by UASB process with 90% soluble COD removal at 5-10 kg COD/ m<sup>3</sup>.d loading rate and at less than 6 hours HRT [Hack, 1985]. The methane content of biogas produced approached 80% and methane yield was observed to be close to the theoretical stoichiometric quantity of 0.35 m<sup>3</sup>/kg COD. In another attempt, brewery wastewater was effectively treated in UASB reactor by Yan *et.al.*, [1996]. Brewery wastewater with an average COD of 2,030 mg/L and biochemical oxygen demand of 1,150 mg/L was used as substrate, and anaerobic digested sludge as inoculum. During start-up, the sludge loading rate was gradually increased when 80% of soluble COD removal efficiency was achieved. After granulation, the UASB reactor gave soluble COD removal efficiencies of 89.1%, under the volumetric loading rate of 12.2 kg COD/m<sup>3</sup>.d and HRT 4 h.

The granulation proceeded successfully in the lab-scale UASB reactor at the average ambient temperature of 21.8<sup>0</sup>C, using brewery wastewater as substrate and anaerobically digested sludge as inoculum. The size of the sludge granules was 0.4 –1.5 mm, the SVI was 14mL/gSS, and the SMA was 0.92 g CH<sub>4</sub> COD/g VSS d [Bal and Dhagat, 2001].

An UASB process was tested by using a pilot plant, capacity 6.2 m<sup>3</sup>, for treating highly concentrated organic wastewater at a beer brewery. Consequently, a high COD removal efficiency of 90% was achieved under a total COD load of 15 kg COD/m<sup>3</sup>.d. Under this conditions where the sludge load in the UASB reactor was 0.5 kg COD/kg VSS.d, stable treatment was achieved with the total COD removal efficiency of over 80% and soluble COD removal efficiency of over 90% [Yoneyama *et.al.*, 1988]. The technical aspects & cost estimation for anaerobic digestion of vinasse and brewery / soft drink wastewaters, using UASB reactors, has been described by Craveiro *et.al.*, [1986].