UPFLOW VELOCITY

Effect of Upflow Velocity

The hydraulic conditions in UASB reactors are generally characterized by the superficial liquid upflow velocity in the reactor, often referred as upflow velocity. It has been reported that liquid upflow velocity has considerable effect on the characteristics of sludge in UASB reactor, thereby acting as a selective process parameter in the cultivation of the biomass [Compos and Anderson, 1992]. Higher upflow velocities, greater than 0.04 m/h, favors better selective process for the sludge and improve mixing in the reactor [Campos and Anderson, 1992, Guiot *et al*., 1992c]. Hence, superficial upflow velocity greater than 0.04 m/h is recommended for reactor start-up.

At very high upflow velocity (1.0 to 1.5 m/h) granules may get disintegrated, the resulting fragments can easily washed out of the reactor [Kosaric *et al*., 1990a, Vieira and Garcia, 1992,]. Also, with the high upflow velocity applied in the initial days (more than 1 m/h) the inoculum material may get washed out of the reactor [Ghangrekar, 1992], because of its poor settling property, and will end in failure in start-up. At small upflow velocities, a hollow core may appear within the granules developed, that, if filled with biogas, can float the granules out of the reactor [Kosaric *et al*., 1990b]. Upflow velocities as 0.25 to 0.5 m/h are favorable for granule growth and accumulation, during normal operation of the reactor. The maximum upflow velocities admissible are 1.2-1.5 m/h. for safe design of UASB reactor [Souza, 1986].

A while treating the wastewater from a fish canning factory in UASBR the influence of upward linear velocity on COD removal percentage, as well as on biomass washout was studied, it is reported that at at upflow velocity up to 0.7 m/hr, the minimization of biomass washout and 80-95% COD removal efficiency was observed [Lema & Punal, 1999].