



Separation of organic matter from domestic sewage in a UASB-ABF system with anoxic bio-flocculation

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ABSTRACT

An anoxic sewage treatment process, an upflow anaerobic sludge blanket (UASB) followed by an aerated bio-filter (ABF), was investigated for the reduction of oxygen demand and the separation efficiency of the organic matter. After recycling the nitrified effluent, complete denitrification occurred in the UASB, with an enhancement in both turbidity characteristics and TCOD removal rates. Low turbidity and COD in the effluent of the UASB reduced the oxygen demand and improved the nitrification efficiency in the subsequent ABF. Both with and without the recycling of the nitrified effluent in the UASB, 95 and 63% of the TCOD values, respectively, were removed. Compared with a conventional activated sludge system, approximately 11.74% of the TCOD was converted to CO₂ in both the UASB and the ABF, generating an approximately 60% reduction in the amount of CO₂. After accumulation in the UASB, 84% of the influent TCOD could be sequestered for use as a marginal energy source in a subsequent anaerobic digester.

Keywords: Anoxic sewage treatment; Bio-flocculation; Separation of organic matter; CO₂ reduction

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