

# UASB treatment of a highly alkaline fruit-cannery lye-peeling wastewater

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## **Abstract**

Anaerobic treatment of a highly alkaline fruit-cannery lye-peeling wastewater was investigated, using an upflow anaerobic sludge blanket (UASB) reactor. Only a short initialisation period was required before COD reduction and OLR had stabilised at 85 to 90% and  $2.40 \text{ kgCOD}\cdot\text{m}^{-3}\cdot\text{d}^{-1}$ , respectively. With subsequent increases in OLR to  $8.1 \text{ kgCOD}\cdot\text{m}^{-3}\cdot\text{d}^{-1}$ , the COD reduction remained between 85 and 93% and biogas production peaked at  $4.1 \text{ l}\cdot\text{d}^{-1}$  (63% methane). COD and reactor pH started to decrease after 111 d. Decreases in gas production were observed by Day 102, decreasing to  $2.48 \text{ l}\cdot\text{d}^{-1}$  by Day 111 and  $0.93 \text{ l}\cdot\text{d}^{-1}$  after 129 d. Subsequent reductions in the OLR, by reducing influent COD, had no effect on reactor stability. Loss of reactor performance was ascribed to the accumulation of sodium (potentially  $> 20\,000 \text{ mg}\cdot\text{l}^{-1}$ ) within the reactor biomass, leading to inhibition of methanogenesis.

**Keywords:** UASB, anaerobic digestion, fruit cannery, treatment, lye