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Effects of hydraulic retention time, co-substrate and nitrogen source on laundry wastewater anionic surfactant degradation in fluidized bed reactors

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Abstract

The aim of this study was to evaluate the influence of hydraulic retention time (HRT) on linear alkylbenzene sulfonate (LAS) removal in fluidized bed reactors (FBRs). FBR1 (HRT of 8 h) and FBR2 (HRT of 12 h) were fed laundry wastewater with 18.6 ± 4.1 to 27.1 ± 5.6 mg/L of LAS in the following conditions: ethanol and nitrate addition (Phases I, II and III), nitrate (Phase IV), ethanol (Phase V) and laundry wastewater (Phase VI). LAS removal was $93 \pm 12\%$ (FBR1) and $99 \pm 2\%$ (FBR2). In FBR1, nitrate influenced significantly on LAS removal ($99 \pm 3\%$ - Phase IV) compared to the phase without nitrate ($90 \pm 15\%$ - Phase V). In FBR1 the absence of ethanol was more favourable for LAS removal ($99 \pm 3\%$ - Phase IV) compared to ethanol addition ($87 \pm 16\%$ - Phase II). In

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