

Effects of Temperature and Hydraulic Residence Time (HRT) on Treatment of Dilute Wastewater in a Carrier Anaerobic Baffled Reactor¹

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Objective To examine the effect of hydraulic residence time (HRT) on the performance and stability, to treat dilute wastewater at different operational temperatures in a carrier anaerobic baffled reactor (CABR), and hence to gain a deeper insight into microbial responses to hydraulic shocks on the base of the relationships among macroscopic performance, catabolic intermediate, and microcosmic alternation. **Methods** COD, VFAs, and microbial activity were detected with constant feed strength (300 mg/L) at different HRTs (9-18 h) and temperatures (10°C-28°C) in a CABR. **Results** The removal efficiencies declined with the decreases of HRTs and temperatures. However, the COD removal load was still higher at short HRT than at long HRT. Devastating reactor performance happened at temperature of 10°C and at HRT of 9 h. HRTs had effect on the VFAs in the reactor slightly both at high and low temperatures, but the reasons differed from each other. Microbial activity was sensitive to indicate changes of environmental and operational parameters in the reactor. **Conclusion** The CABR offers to certain extent an application to treat dilute wastewater under a hydraulic-shock at temperatures from 10°C to 28°C.

Key words: Carrier anaerobic baffled reactor; Dilute wastewater; Hydraulic residence time; Temperature

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