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Original Article

EFFECT OF DYE CONCENTRATION ON SEQUENCING BATCH REACTOR PERFORMANCE

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Abstract:

Reactive dyes have been identified as problematic compounds in textile industries wastewater as they are water soluble and cannot be easily removed by conventional aerobic biological treatment systems. The treatability of a reactive dye (Brill Blue KN-R) by sequencing batch reactor and the influence of the dye concentration on system performance were investigated in this study. Brill Blue KN-R is one of the main dyes that are used in textile industries in Iran. Four cylindrical Plexiglas reactors were run for 36 days (5 days for acclimatization of sludge and 31 days for normal operation) at different initial dye concentrations. The dye concentrations were adjusted to be 20, 25, 30 and 40 mg/L in the reactors R1, R2, R3 and R4, respectively. In all reactors, effective volume, influent wastewater flowrate and sludge retention time were 5.5 L, 3.0 L/d and 10 d, respectively. According to the obtained data, average dye removal efficiencies of R1, R2, R3 and R4 were $57\% \pm 2$, $50.18\% \pm 3$, $44.97\% \pm 3$ and $30.98\% \pm 3$, respectively. The average COD removal efficiencies of all reactors were $97\% \pm 1$, $97.12\% \pm 1$, $96.93\% \pm 1$ and $97.22\% \pm 1$, respectively. The dye removal efficiency was decreased by increasing the dye concentration with the correlation coefficient of 0.997.

Keywords:

[Biological treatment](#) , [sequencing batch reactor](#) , [reactive dyes](#) , [Brill Blue KN-R](#)

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