



Exploring by-products generated by the anaerobic degradation process of synthetic wastewater containing indigo dye

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ABSTRACT

This work aims to study the by-products generated by the anaerobic degradation process of synthetic wastewater containing indigo dye. These by-products were analysed and identified by both high performance liquid chromatography (HPLC) and nuclear magnetic resonance (¹H NMR). HPLC results showed the dependence of the by-products to the operating conditions. The obtained HPLC chromatogram at the end of the experiments (Run 1) reveals different fractions, with at least eight distinguishable by-products. Increasing the hydraulic retention time from 1 to 5 days (Run 5) which corresponding to the start up of the bioreactor caused a significant change of the obtained HPLC chromatogram, with the decrease of the number of these by-products to only 3 ones. ¹H NMR analysis was realised with three representative fractions. The results showed that hypothetical structure of the by-products corresponding to aromatic cycles 1,2-disubstituted and possessing an axial symmetry similar to the phthalate groups.

Keywords: Anaerobic; Biodegradation; Decolourization; Indigo; Nuclear magnetic resonance

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