Simulated textile (batik) wastewater pre-treatment through application of a baffle separation tank

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ABSTRACT

One of the main cultural heritages associated with South-East Asian people’s way of life and economy is batik. Not only batik is a part of textile industries, playing an important role in industrial development, it also, like other wet textile processes, generates huge amounts of hazardous wastewater. Due to the presence of wax in the batik production process an efficient wastewater pre-treatment is necessary to appropriately prepare related effluent conditions for further conventional wastewater treatment. Accordingly, in this study, the application of a baffle separation tank to treat simulated batik effluent as an innovative wastewater pre-treatment method was investigated. Therefore, two sets of simulated batik wastewaters containing constant amounts of chemical components (wax, dye, and sodium silicate with different reactive dyes) were tested. In the next step, the removal efficiency of the discussed samples’ chemical components was calculated based on pre- and post-process analytical experiments during an hour-long pre-treatment run. Wax, sodium silicate, and reactive dye removal through the runs were in the ranges of 92–95, 32–42, and 2–5%, respectively. The results showed slight decreases in pH, COD, and conductivity values in the post-treated samples, the differences of which were within the ranges of 0.2–0.6, 52–107 mg/L and 9–27 μS/cm, respectively. Moreover, this technique presented an effective rate of reduction for effluent samples’ existing heavy metal concentration.

Keywords: Textile wastewater pre-treatment; Batik wastewater; Baffle separation tank; Sustainable treatment technique

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