



## Performance of commercial membranes in a side-stream and submerged membrane bioreactor for model textile wastewater treatment

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### ABSTRACT

Membrane bioreactor (MBR) is one of the last techniques that allow a high quality of treated industrial effluents, which can be perfectly integrated into industrial processes, not only for the quasi-total reuse of water but also for the reduction of the manufacturing cost. The main objective of this work was to make a study, comparing the performance of commercial membranes in a side stream membrane bioreactor (SSMBR) and submerged membrane bioreactor (SMBR), at laboratory scale, for the treatment of the same Model Textile Dye Wastewater (MTDW). In order to reach the target, we kept the same operating conditions for both of the units SSMBR and SMBR, namely pH, temperature, conductivity, and MLSS, whereas the hydraulic retention time (HRT) was different. This is due to the reactors capacities and the membrane module surface being different (20 L/0.00856 m<sup>2</sup> and 57 L/0.33 m<sup>2</sup>) for side-stream and submerged MBR, respectively. The COD removal efficiency was varied between 90 and 97%, respectively, and color rejection was found in the range of 20–40% for red dye and 50–90% for blue dye in both units. In order to improve the wastewater quality, a nanofiltration membrane (NF) was tested in the SSMBR unit and still has to be tested in the SMBR.

*Keywords:* Side-stream membrane bioreactor; Submerged membrane bioreactor; Model textile dye wastewater; Ultrafiltration; Nanofiltration

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