



## Removal of anionic surfactants by nanofiltration

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### ABSTRACT

This work addresses the assessment of nanofiltration (NF) in terms of membrane characteristics, operating transmembrane pressure and feed composition for the maximal removal of anionic surfactants in wastewater from a detergent industry. Model solutions of linear alkylbenzene sulphonates (LAS) and sodium lauryl ether sulphates (SLES) covering a wide range of SLES/LAS ratios are used as surrogates of the wastewaters with 0.43 g l<sup>-1</sup> of methylene blue active substances (MSAS). The NF experiments are carried out in a unit equipped with NF-90, NF-200 and NF-270 membranes (FilmTec Corp., USA). The applied pressure varied from 15 to 25 bar. The rejection coefficients to total organic carbon (TOC) are practically independent of pressure and are higher than 95% for all model solutions and higher than 92% for the wastewater. The SLES solutions have the highest permeation fluxes of 20–33, 121–207 and 242–371 kg h<sup>-1</sup> m<sup>-2</sup> for NF90, NF200 and NF270 membranes, respectively. The permeation fluxes for the other model solutions have intermediate values between the ones of the SLES solution and the ones of the wastewater. These present permeations fluxes as low as 10–11 kg h<sup>-1</sup> m<sup>-2</sup> for the NF 200 and the NF 270 membranes.

*Keywords:* Nanofiltration; Model solutions; Industrial wastewaters; Membrane; Adsorptive fouling; Anionic surfactants

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