ABSTRACT

The aim of this manuscript was the study of the recovery of bioethanol produced by the fermentation of the lignocellulosic biomass (olive bagasse) by nanofiltration. In terms of downstream processing, the nanofiltration permeate stream was expected to be comprised mostly of water and ethanol, and as such, ethanol may be further recovered by conventional distillation. Different nanofiltration membranes (NF90 and NF270) were tested for their efficiency in the separation of bioethanol. Model aqueous solutions of ethanol and sugars, and real liquors were processed by nanofiltration focusing on flux and rejection performance. The results shown that the more complex medium of a real liquor interacts with the membrane and lower the rejection to target solutes. Generally, both membranes tested were suitable for separating and recovering ethanol from a fermentation medium. The diafiltration mathematical model developed in this work shown to be capable of describing experimental results, which may be considered extremely important for process design and scaling up purposes.

Keywords: Bioethanol recovery; Nanofiltration; Diafiltration; Olive bagasse; Sustainable membrane processing