



ABSTRACT SUBMISSION

Title: Forward osmosis applied during concentration of biogas digestates using hide preservation effluents from tannery industry as draw solution

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Abstract [Abstract International Conference on Desalination using Membrane Technology Forward osmosis M.S. Camilleri-Rumbau.doc](#)

Template used Yes

Text Abstract The generation of large volumes of digestates from manure and organic waste co-digestion, is becoming a challenge in waste management. Volume reduction techniques, such as solid-liquid separation, allows to obtaining a solid fraction, rich in phosphorous and a liquid fraction with a relatively lower fertilizer value. In this study, forward osmosis was applied as a concentration technique of these liquid fractions to increase their fertilizer value. Draw solutions, namely NaCl model solution and a source of hide preservation wastewater from tannery industry, previously pretreated were studied. The pretreatment of this real highly saline draw solution were prolonged aeration and desulfurization. Similarly, the digestate liquid fraction (pH 8.4) was pretreated using acidification with sulfuric acid until pH 6.7.

The results showed that total ammonia nitrogen concentration increased about 50% in the digestate liquid fraction when hide preservation wastewater was used as a draw solution. Results also suggested that acidification of digestate liquid fractions led to an approximately 50% lower permeate final flux compared to non-acidified feed, when using hide preservation wastewater as real draw solution. Total solids in the feed solution increased more than 23 % after 12h of concentration using a membrane area of 42 cm².

After membrane fouling, the formed cake layer at the feed side of the membrane could be removed easily, suggesting that fouling was mostly reversible. Membrane inspection using Scanning Electron Microscopy, Energy-dispersive X-ray spectroscopy and Fourier transform infrared spectroscopy confirmed that membrane fouling was independent of the draw solution and the feed pretreatment. All in all, results showed that aquaporin-based FO membranes could potentially be used for concentration of digestate liquid fractions using hide preservation wastewater as real draw solution.

App Yes

Approval Confirm

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