

Interactive comment on “Evaluation of Thin Film Composite Forward Osmosis Membranes: Effect of Polyamide Preparation Conditions” by Aya Mohammed Kadhom et al.

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Dear Reviewer, We appreciate your valuable comments on our manuscript and the fruitful discussion points that you have raised; below are our answers to your comments: The authors presented the effect of exposure time of MPD and TMC on the water/salt flux in the prepared FO membranes. From the desalination point of view, an optimal FO membrane should have high water flux but low salt flux. Why did the authors concluded that the best results were found to be at 5 min for MPD and 1 min for TMC reaction times (highest water and salt fluxes)? Even though the salt flux increased when water flux increased (at 5 min for MPD and 1 min for TMC), but the

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salt flux still within the acceptable limit where the J_s/J_w ratio is 0.25 g/L compared to what has been reported in the literature. So, we concluded that this membrane was the optimum as it provided the highest water flux with a salt flux of an acceptable value. In the figures, please avoid using abbreviations like LMH, GMH. The figures will be updated in the next version, according to the reviewer's comment. In the authors publication: M. Al-Furajji et al.: TFC membranes supported with nanofibers for forward osmosis process, the water and salt flux reported is much lower as compared with the values presented in this manuscript. What drives such differences? If we zoom-in to compare the water flux and salt flux reported in M. Al-Furajji et al.: TFC membranes supported with nanofibers for forward osmosis process (previous work) and in current work, the water flux is approx 4 time higher than that reported in previous work, but the salt flux is approx 6-8 time higher than that reported in previous work. This means that the salt rejection by the FO membrane prepared in the current work will be significantly lower than the membrane prepared in your previous work. it will be interesting comparison to be discussed in the manuscript. We appreciate the reviewer's comments. To compare our previous TFC membrane with the current one, we should compare both membranes at the same preparation conditions (MPD= 2min, and TMC= 1min.); please see the following table.

Water flux	Salt flux	This work	Previous work
35.58 ± 7	6.8 ± 2		
16 ± 1.5	4 ± 0.5		

It can be seen that the water flux of the current work is about twice that of the previous work, while the salt flux is a bit higher. There are two main differences between the previous work and the current work: 1. In the previous work, we used PAN polymer as a support for the TFC FO membrane, while in this work, we used PSU polymer. 2. In the previous work, the support layer was prepared using the electrospinning method while in this work phase inversion method was used. The polyamide layer was perfectly formed and well distributed on the PSU support layer compared to the PAN nanofibers based membrane. This is most likely due to the smaller pore size and the hydrophobic nature of the PSU substrate. Although, electrospinning method produces a highly porous membrane, but phase inversion makes a more robust membrane that

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can perform better in FO testing.

Please also note the supplement to this comment:

<https://dwes.copernicus.org/preprints/dwes-2020-33/dwes-2020-33-AC2-supplement.pdf>

Interactive comment on Drink. Water Eng. Sci. Discuss., <https://doi.org/10.5194/dwes-2020-33>, 2020.