Reply:

Warmuzinski et al. have highlighted two issues in their recent letter to you:

1. They referred to our assumption $d(x_iF_f) = y_i dF_f$ and commented that it cannot "be reconciled with the statement that *the concentration of permeate changes through the fiber length*". We believe that the confusion behind this comment has arisen because we have not presented detailed modeling in this article as modeling was not our main objective, but rather the article was focused on the application, namely analysis of membrane systems for carbon capture.

There are two different permeate concentrations in our model. One is y_i the molar fraction of component i within the diffusing gas (dF_f) at any segment of dz. There is, however, another variable y_{p_i}, which is the molar fraction of component i within the hollow fiber (permeate bulk flow), which is postcalculated using mass-balance equations. We understand that our y_i is y_i^* in their Eq. 1, and our y_{p_i} is y_i in their Eq. 2.

Therefore, we confirm that there are two different molar fraction definitions, but we highlight that only the segmental variable (our y_i or their y_i^*) is used in the DAE set of equations. We also confirm that the molar fraction in our Eq. 3 is misspelled and must be y_{p_i}. We refer Warmuzinski et al. to detailed modeling discussed elsewhere.[1]

2. Their comment on the flow pattern has detected misplacement of the flow directions in our Figures 2 and 3. The comment is valid and accepted.

Literature Cited

1. Khalilpour R, Abbas A, Lai Z, Pinnau I. Analysis of hollow fibre membrane systems for multicomponent gas separation. *Chem Eng Res Des*. In Press. 2012. doi:10.1016/j.cherd.2012.07.009.

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