

$$\begin{aligned}
 -D \frac{\partial C}{\partial r} &= k_l C_{M^{2+},l} - k'_l C_{MR_2,m,l} = k_m (C_{MR_2,m,l} - C_{MR_2,m,s}) \\
 &= k'_s C_{MR_2,m,s} - k_s C_{M^{2+},m,s} \\
 &= k_s (C_{MR_2,m,s} - C_{M^{2+},s})
 \end{aligned} \tag{A8}$$

Equation A8 can be arranged as

$$-D \frac{\partial C}{\partial r} = \frac{C_{M^{2+},l} - \frac{k_s k'_l}{k_l k'_s} C_{M^{2+},s}}{\frac{1}{k_l} + \frac{k'_l}{k_l K_m} + \frac{k'_l}{k_l k'_s} + \frac{k_s k'_l}{k_l k'_s k_s}} \tag{A9}$$

Let

$$C' = \frac{C_{M^{2+},l} - \frac{k_s k'_l}{k_l k'_s} C_{M^{2+},s}}{C_{M^{2+},l} - \frac{k_s k'_l}{k_l k'_s} C_{M^{2+},s}} \tag{A10}$$

$$Sh_w = \frac{2R}{D \left(\frac{1}{k_l} + \frac{k'_l}{k_l K_m} + \frac{k'_l}{k_l k'_s} + \frac{k_s k'_l}{k_l k'_s k_s} \right)}, \tag{A11}$$

then Eq. A9 can be reduced to Eq. 15.

When the operation is executed in the cocurrent or countercurrent mode and the shell concentration variation along the axial direction is included, BC3 identical to Eq. 27 can be derived as well, where $m = (k'_l/k_l)$ for MBE and $m = (k_s k'_l/k_l k'_s)$ for SLM, respectively.

Therefore, m is actually the interfacial reaction equilibrium constant at the lumen interface for the MBE case, and m is actually the ratio of the interfacial reaction equilibrium constant at the lumen interface to that at the shell interfacial for the SLM case.

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Corrections

- In the article titled "Two-Dimensional Model for Circulating Fluidized-Bed Reactors" (July 1996, p. 1875), the sixth line below Eq. 19 on p. 1880 "Luca et al. (1995)" should be changed to "Marmo et al. (1995)." In addition, the names of authors of "Comparison Among Several Predictive Models for Circulating Fluidized Bed Reactors" in the Literature Cited section (p. 1888) should be changed to "Marmo, L., L. Manna, and G. Rovero" from "Luca, M., M. Luigi, and R. Giorgio."
- In the article titled "High-Energy Density Storage of Natural Gas in Light Hydrocarbon Solutions (April 1997, p. 1108), the captions for Figures 3, 4 and 5 should read "...stored in 21 MPa," not "...stored at 21 MPa." Additionally, in Figure 3 "...vs. CNG" should be changed to "...vs. CNG at 21 MPa."