

Side-side all

714/727-1012
727-5134

Lin William Terry

714-727-5134

called 402 & 4
and discussed with jury.

K is only an adjustable
parameter. No further
speculation.

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called to get permission or acknowledgment
he was out of town.

$$\frac{dC_d}{dt} = \frac{2 P_{\text{molar}} D_{ab}}{\phi} \left[\frac{C_a}{M_{\text{molar}}} - K \frac{P''}{P'} \right] M_{\text{molar}} \frac{r}{r_{\text{molar}}} = R$$

$$\frac{dC_d}{dt} = 0 = h D_{ab} \frac{d^2 C_a}{dz^2} - \frac{R}{\epsilon}$$

$$h = \frac{\epsilon}{\tau} \quad \epsilon = \text{void fraction} \quad \tau = \text{porosity}$$

$$\frac{dC_d}{dt} = 0 = \frac{\epsilon}{\tau} D_{ab} \frac{d^2 C_a}{dz^2} - \frac{R}{\epsilon}$$

or

$$\left| \left(\frac{\epsilon^2}{\tau} \right) D_{ab} \frac{d^2 C_a}{dz^2} = R \right|$$

Egn 1.

True only for short periods of time. This is basis for Jurek's model. This is different with Jurek's model.

$$\frac{dC_d}{dt} = \alpha (C_a - K' C_d) = R$$

Collect toward with
constant α and K'
(Eqn 2)

Now from material balance, we have

~~Now~~

$$C_a = K' C_d \quad (\text{Eqn 3})$$

$$\frac{dC_d}{dt} = \frac{1}{K'} \frac{dC_a}{dt} = R \quad (\text{Eqn 4})$$

Substitution into Eqn 1

$$\frac{1}{K'} \frac{dC_a}{dt} = \frac{C^2}{\gamma} Dab \cdot \frac{d^2 C_a}{dz^2}$$

or

$$\frac{dC_a}{dt} = \frac{C^2}{\gamma} Dab K' \frac{d^2 C_a}{dz^2}$$

Int w.o. boundary that over the limit

$$\lim_{t \rightarrow \infty} \frac{dC_a}{dt} = 0$$

$$\frac{d}{dt} \left[C_a \left(\epsilon + \frac{1}{K} \right) \right] = \epsilon h D_{ab} \frac{\sqrt{C_a}}{\sqrt{Z^2}}$$

or

$$\frac{d C_a}{dt} = \frac{\epsilon h D_{ab}}{\epsilon + \frac{1}{K}} = \frac{\epsilon h D_{ab} \frac{\sqrt{C_a}}{\sqrt{Z^2}}}{\epsilon + \frac{1}{K}}$$