

Corrections for EOR Lecture Note

Session 8: Feb 26, 2009

Molar Density, lbmole/ft³

$$\xi_o(p_o, T) = 1.683(0.1987 - 7.5885 \times 10^{-5}T) \exp[1.0 \times 10^{-5}(p_o - 14.7)]$$

Session #10: March 19, 2009

Steam injection with three phases and four components

Component Mass Balance

C1:

$$\begin{aligned} & \Delta[(T_o \xi_o x_{o1})^n (\Delta p_o^{n+1} - \gamma_o^n \Delta D)] + \Delta[(T_g \xi_g y_1)^n (\Delta p_g^{n+1} - \gamma_g^n \Delta D)] + VR \alpha_1 r_c \\ & + (\xi_o q_o x_{o1} + \xi_g q_g y_1)^* = \frac{VR}{\Delta t} \Delta_t [\phi(S_o \xi_o x_{o1}) + (S_g \xi_g y_1)] \end{aligned}$$

C2:

$$\begin{aligned} & \Delta[(T_o \xi_o x_{o2})^n (\Delta p_o^{n+1} - \gamma_o^n \Delta D)] + \Delta[(T_g \xi_g y_2)^n (\Delta p_g^{n+1} - \gamma_g^n \Delta D)] \\ & + (\xi_o q_o x_{o2} + \xi_g q_g y_2)^* = \frac{VR}{\Delta t} \Delta_t [\phi(S_o \xi_o x_{o2}) + (S_g \xi_g y_2)] \end{aligned}$$

C3:

$$\begin{aligned} & \Delta[(T_o \xi_o x_{o3})^n (\Delta p_o^{n+1} - \gamma_o^n \Delta D)] - VR r_c (\alpha_1 + \alpha_{coke}) \\ & + (\xi_o q_o x_{o3})^* = \frac{VR}{\Delta t} \Delta_t [\phi(S_o \xi_o x_{o3})] \end{aligned}$$

C4:

$$\begin{aligned} & \Delta[(T_w \xi_w x_{w4})^n (\Delta p_w^{n+1} - \gamma_w^n \Delta D)] + \Delta[(T_g \xi_g y_4)^n (\Delta p_g^{n+1} - \gamma_g^n \Delta D)] \\ & + (\xi_w q_w x_{w4} + \xi_g q_g y_4)^* = \frac{VR}{\Delta t} \Delta_t [\phi(S_w \xi_w x_{w4}) + (S_g \xi_g y_4)] \end{aligned}$$

Unit: $\alpha_1 r_c = \left[\frac{\text{lb}_{\text{mole of } C_1}}{\text{ft}^3 \text{ of rock-day}} \right]$ and

$$\alpha_1 r_{coke} = \left[\frac{\text{lb}_{\text{mole of coke}}}{\text{ft}^3 \text{ of rock-day}} \right]$$