$\dot{M}_{k,i}$ $\dot{M}_{k,e}$

Gas phase reactions

Surface reactions

Differential Equations for Catalytic Combustor

Gas-phase species mole fractions:

$$\frac{dX_k}{dt} = \frac{1}{[C]}\left(-\frac{1}{\varphi_g}\frac{dN_k}{dx} + \dot{\omega}_k + \frac{\dot{s}_k a_{surf}}{\varphi_g}\right)$$

Surface species site fractions:

$$\frac{d\theta_k}{dt} = \frac{1}{\Gamma}\dot{s}_k$$