

$$D(t, oco) := \begin{bmatrix} O_{2i} \\ CO_{2i} \\ m_{pr} := oco \\ W_1 \\ HR_1 \\ r_{O2} := \frac{V_{m1} \cdot O_{2i}}{K_{m1} + \left(1 + \frac{CO_{2i}}{K_{i1}}\right) \cdot O_{2i}} \cdot \exp\left(-\frac{E_{O2}}{R} \cdot \left(\frac{1}{T_s} - \frac{1}{T_{ref}}\right)\right) \\ r_{CO2} := \frac{V_{m2} \cdot O_{2i}}{K_{m2} + \left(1 + \frac{CO_{2i}}{K_{i2}}\right) \cdot O_{2i}} \cdot \exp\left(-\frac{E_{CO2}}{R} \cdot \left(\frac{1}{T_s} - \frac{1}{T_{ref}}\right)\right) \\ RH := \frac{HR_1}{HR_{sat}} \\ VDP := \left((a_w - RH) \cdot P_s\right) \\ m_w := VDP \cdot K_t \\ t_x := m_w \cdot A_c \\ \frac{100}{V} \cdot \begin{bmatrix} \frac{A_p \cdot P_{O2} \cdot P_{atm}}{L_f} \cdot (0.01 \cdot (O_{2o} - O_{2i})) - W_s \cdot r_{O2} \\ \frac{A_p \cdot P_{CO2} \cdot P_{atm}}{L_f} \cdot (0.01 \cdot (CO_{2o} - CO_{2i})) + W_s \cdot r_{CO2} \\ \frac{P_{H2Oref} \cdot A_p \cdot \left(\frac{t_x}{M_{H2O} \cdot 10^{-3}} - 0.027 \cdot 10^{-12}\right)}{L_f} \\ \frac{(t_x + M_c \cdot r_{CO2} \cdot W_s)}{100} \\ \frac{t_x - m_{pr}}{W_a \cdot 100} \end{bmatrix} \cdot V \end{bmatrix}$$

$$oco_0 := \text{stack}(21.0, 0.03, 0, 0.0001, 0) \quad t_{min} := 0 \quad t_{max} := 200 \quad steps := 800$$

$$AbsTol := 10^{-9} \quad RelTol := 10^{-9}$$