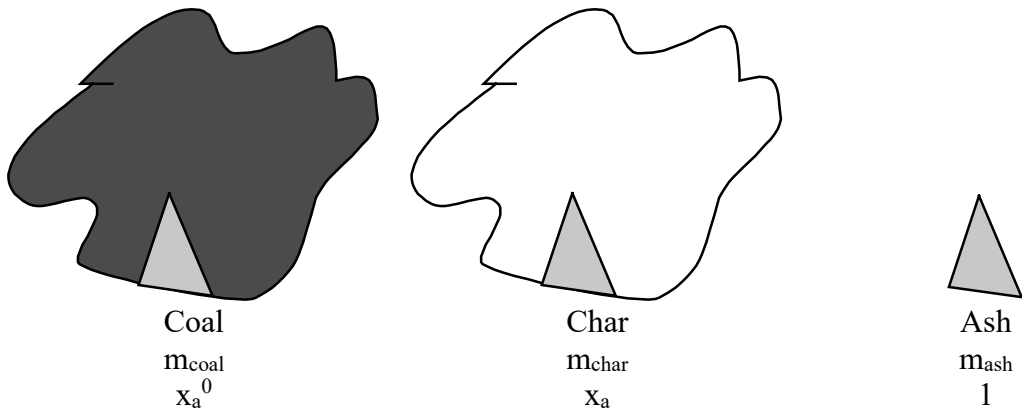


Ash Tracer Analysis



$$\% \text{ mass release (daf)} = \frac{m_{\text{coal}} - m_{\text{char}}}{m_{\text{coal}} - m_{\text{ash}}}$$

Assuming that the mass of ash remains constant, then

$$m_{\text{coal}} x_{a,\text{coal}} = m_{\text{char}} x_{a,\text{char}} = m_{\text{ash}}$$

or

$$m_{\text{coal}} x_a^0 = m_{\text{char}} x_a = m_{\text{ash}}$$

Solving for the mass of char and the mass of ash,

$$m_{\text{char}} = \frac{m_{\text{coal}} x_a^0}{x_a}, \quad m_{\text{ash}} = m_{\text{coal}} x_a^0$$

Now back substitute to get an expression for the % mass release:

$$\% \text{ mass release (daf)} = \frac{m_{\text{coal}} - m_{\text{coal}} \frac{x_a^0}{x_a}}{m_{\text{coal}} - m_{\text{coal}} x_a^0}$$

Now divide by m_{coal} :

$$\% \text{ mass release (daf)} = \frac{1 - \frac{x_a^0}{x_a}}{1 - x_a^0}$$

Significance: measure ash content of char and parent coal to get mass release!