

# What is the definition of OTR, CTR and RQ?

The relevant quotations are derived from the mass balance around the gasphase inside the reactor:

$$\text{OTR} = (\dot{V}_{\text{in}} * y_{\text{O}_2\text{in}} - \dot{V}_{\text{out}} * y_{\text{O}_2\text{out}}) / V_w$$

$$\text{CTR} = (\dot{V}_{\text{out}} * y_{\text{CO}_2\text{out}} - \dot{V}_{\text{in}} * y_{\text{CO}_2\text{in}}) / V_w$$

$$\text{RQ} = \text{CTR} / \text{OTR}$$

with:

OTR / CTR = oxygen / carbon dioxide transfer rate [mol/L/h]

$\dot{V}_{\text{in}} / \dot{V}_{\text{out}}$  = Gasflow at inlet / outlet of the reactor [L/h]

$V_w$  = actual working volume inside the reactor [L]

$y_{\text{Xin}} / y_{\text{Xout}}$  = molar concentration of gas X in the inlet / outlet [mol/L]

