$$C_{A_{tot}} = \left(\frac{m}{m-1}\right)\frac{(C_{Am-1})}{C_{A0}^2}$$

$$\frac{C_{A_1}}{C_{A0}} = \bar{C}_A$$

so the general form of equation

$$\bar{C}_A = \frac{\alpha}{(m-1)\left(\frac{1}{\eta} + \frac{\beta}{m}\right)}$$

when $m \uparrow$ $\eta \uparrow$ for $\bar{C}_A$ to be constant

so greater value of m greater the value of η

$$\eta = \frac{\tau V}{q} = \left(\frac{V/q}{1/k}\right)$$

= ratio of timescale

so $\eta > 1$ mem residence time > rxn time & vice versa