

# Slide#13

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i) CSTR

$$\frac{C}{C_0} = \frac{1}{1 + k\tau} = \frac{1}{1 + (10 \text{ day}^{-1})(0.2 \text{ day})} = 0.333 \quad \Rightarrow \quad 66.7\% \text{ removal}$$

ii) 3 CSTRs in series

$$\frac{C}{C_0} = \frac{1}{(1 + k\tau/3)^3} = \frac{1}{\{1 + (10 \text{ day}^{-1})(0.2 \text{ day})/3\}^3} = 0.216 \quad \Rightarrow \quad 78.4\% \text{ removal}$$

iii) PFR

$$\frac{C}{C_0} = e^{-k\tau} = e^{-(10 \text{ day}^{-1})(0.2 \text{ day})} = 0.135 \quad \Rightarrow \quad 86.5\% \text{ removal}$$