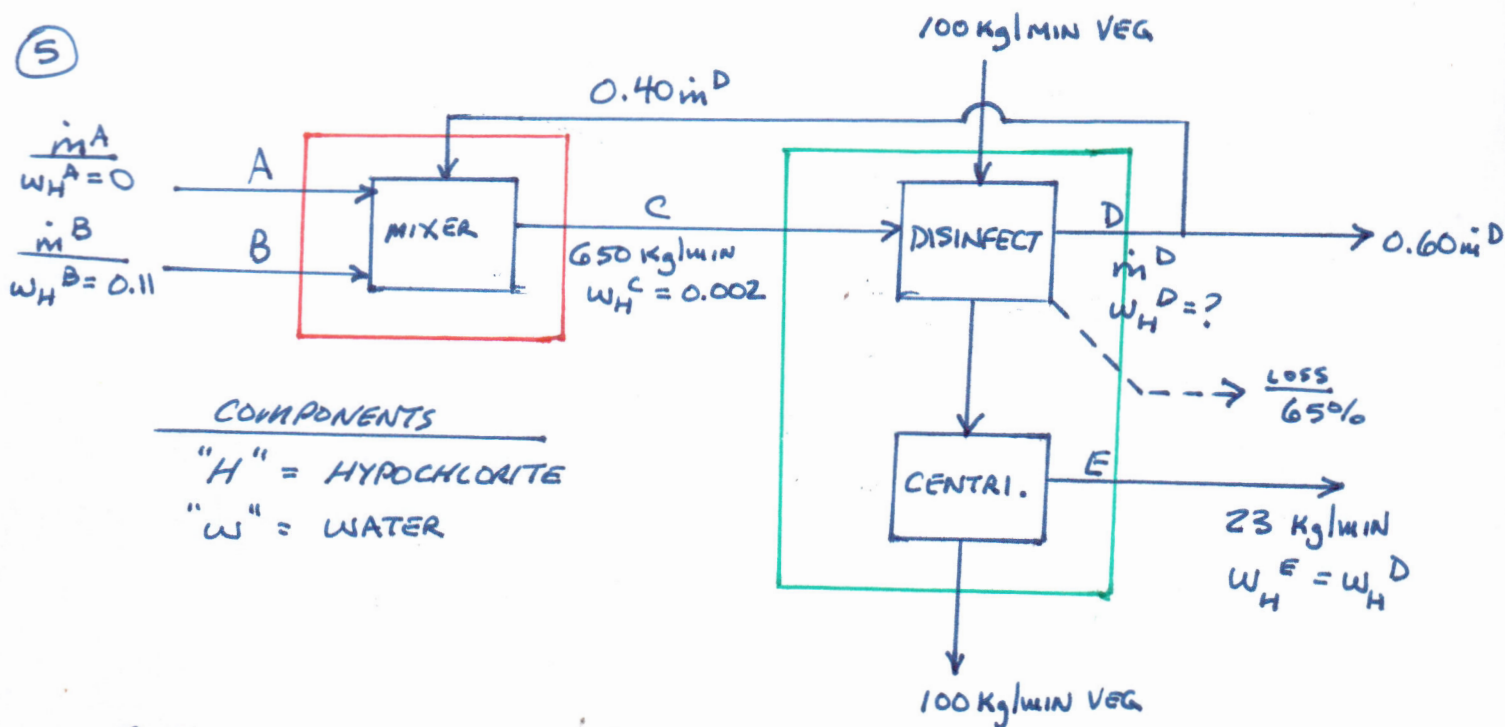


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COMPONENTS

"H" = HYPOCHLORITE

"W" = WATER

BALANCES AROUND DISINFECT/CENTRIFUGE
(EXCLUDING VEGETABLES)

H

ACC = IN - OUT + GEN

$$0 = w_H^C \dot{m}^C - (w_H^D \dot{m}_H^D + w_H^E \dot{m}_H^E) - \dot{m}_H^{LOSS}$$

$$\dot{m}_H^{LOSS} = 0.65 w_H^C \dot{m}^C$$

$$w_H^E = w_H^D$$

$$\begin{aligned} 0 &= (0.002)(650) - w_H^D (\dot{m}_H^D + \dot{m}_H^E) - 0.65 w_H^C \dot{m}^C \\ &= (0.002)(650) - w_H^D (\dot{m}_H^D + \dot{m}_H^E) - (0.65)(0.002)(650) \\ w_H^D (\dot{m}_H^D + \dot{m}_H^E) &= 0.455 \text{ kg/min} \end{aligned}$$

OVERALL

ACC = IN - OUT

$$0 = \dot{m}^C - (\dot{m}^D + \dot{m}^E)$$

$$0 = 650 - \dot{m}^D - 23$$

$$\dot{m}^D = 627 \text{ kg/h}$$

$$\text{so, } w_H^D (650) = 0.455 \Rightarrow w_H^D = 0.0007$$

BALANCES AROUND MIXER

H

ACC = IN - OUT + GEN

$$0 = w_H^A \dot{m}^A + w_H^B \dot{m}^B + 0.40 \dot{m}^D w_H^D - w_H^C \dot{m}^C$$

$$0 = 0 + (0.11)(\dot{m}^B) + (0.40)(627)(0.0007) - (0.002)(650)$$

$$\dot{m}^B = 10.2 \text{ kg/min}$$

OVERALL

$$ACC = IN - OUT$$

$$0 = \dot{m}^A + \dot{m}^B + 0.40 \dot{m}^D - \dot{m}^C$$

$$0 = \dot{m}^A + 10.2 + (0.40)(627) - 650$$

$$\dot{m}^A = 389.0 \text{ Kg/min}$$

ANSWER QUESTIONS

$$i) \quad \dot{m}^B = 10.2 \text{ Kg/min}$$

$$ii) \quad (0.40)(\dot{m}^D) = (0.40)(627) = 250.8 \text{ Kg/min}$$

$$iii) \quad \dot{m}_H^{loss} = (0.65)(650)(0.002) = 0.845 \text{ Kg/min}$$

$$iv) \quad \omega_H^E \dot{m}^E + 0.60 \omega_H^D \dot{m}^D = (0.0007)(23) + (0.60)(0.0007)(627) \\ = 0.279 \text{ Kg/min}$$

$$v) \quad \frac{0.279}{\omega_H^B \dot{m}^B} = \frac{0.279}{(0.11)(10.2)} = 0.249 \Rightarrow 24.9\%$$