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level 6 thermo Marcos Gonzalez

c)

$$\dot{Q}_{act} = \epsilon \cdot \dot{Q}_{max}$$

$$\epsilon = \frac{1 - e^{-NTU \cdot (1 - Cr)}}{1 - Cr e^{-NTU \cdot (1 - Cr)}}$$

$$Cr = \frac{C_{min}}{C_{max}} = 1.095 \times 10^{-3}$$

$$\frac{1 - e^{-1.406 \cdot (1 - 1.095 \times 10^{-3})}}{1 - 1.095 \times 10^{-3} e^{-1.406 \cdot (1 - 1.095 \times 10^{-3})}} = 0.755$$

$$\dot{Q}_{max} = C_{min} \cdot (T_{hi} - T_{ci})$$

$$9.4594 (150 - 8) = 1343.258 \text{ W}$$

$$1343.26 \times 0.755 = \underline{1013.918 \text{ W}}$$

e)

$$\dot{Q}_{act} = C_H (T_{hi} - T_{ho})$$

$$\dot{Q}_{act} = C_c (T_{co} - T_{ci})$$

$$T_{ho} = T_{hi} - \frac{\dot{Q}_{act}}{C_H} = 150 - \frac{1013.9}{8641.227} = \underline{149.88^\circ \text{C}}$$

$$T_{co} = T_{ci} + \frac{\dot{Q}_{act}}{C_c} = 8 + \frac{1013.9}{9.459} = \underline{115.18^\circ \text{C}}$$