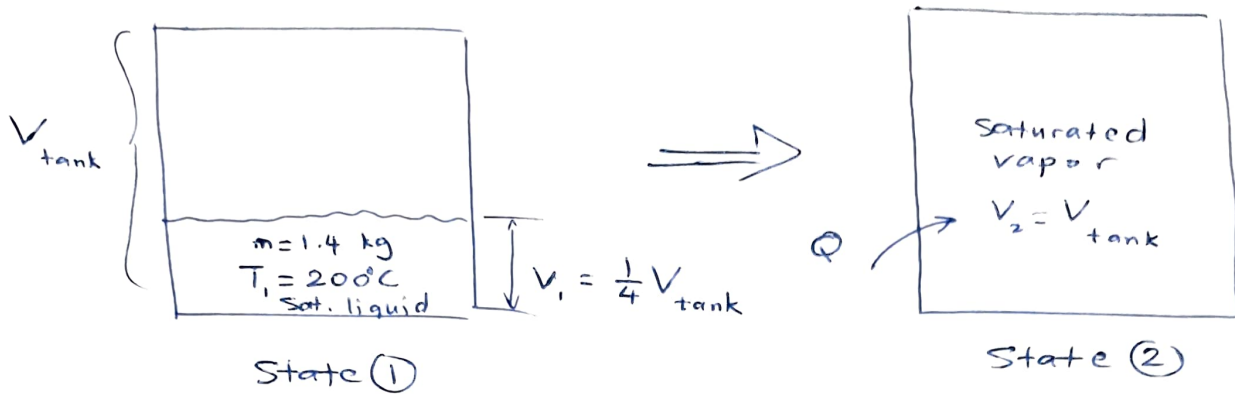


Problem 3-61



Part (a): $V_{\text{tank}} = 4 V_1$

$V_1 = m v_1 = m \times v_{f@200^\circ\text{C}} = 1.4 \times 0.001157 = 0.00162 \text{ m}^3$ (from Table A-4)

$\rightarrow V_{\text{tank}} = 4 \times 0.00162 = 0.00648 \text{ m}^3$

Part (b): At state ②, we know the phase is saturated vapor

We also know $v_2 = \frac{V_2}{m} = \frac{V_{\text{tank}}}{m} = \frac{0.00648}{1.4} = 0.00463 \frac{\text{m}^3}{\text{kg}}$

\rightarrow Go to Table A-4 and look for $v_g = 0.00463$

$\rightarrow T = 370.7^\circ\text{C}$

Part (c): $\Delta U = U_2 - U_1 = m(u_2 - u_1)$

$u_1 = u_{f@200^\circ\text{C}} = 850.46 \text{ kJ/kg}$ (from Table A-4)

$u_2 = u_{g@370.7^\circ\text{C}} = 2192.4 \text{ kJ/kg}$ (By interpolation)

$\rightarrow \Delta U = 1.4 (2192.4 - 850.46) = 1878.68 \text{ kJ}$

