

$$\Delta T = 5873.91 \text{ K}$$

$$\Delta U = \frac{3}{2} \cdot 10^{22} \cdot 1.38 \times 10^{-23} \text{ J/K} \cdot 5873.91 \text{ K}$$

$$= 1215.9 \text{ J}$$

$$(d) Q = \Delta U - W$$

$$= 1215.9 \text{ J} - (-405.3 \text{ J})$$

$$= 1621 \text{ J}$$

(e) You might put the container in an oven as it is mechanically expanded.

$$1.34) (a) W_A = P \Delta V = 0$$

$$W_B = P_2 (V_2 - V_1)$$

$$W_C = P (V_2 - V_2) = 0$$

$$W_D = P_3 (V_2 - V_1)$$

$$\Delta U_A = \frac{5}{2} (P_2 - P_1) V_1$$

$$\Delta U_B = \frac{5}{2} P_2 (V_2 - V_1)$$

$$\Delta U_C = \frac{5}{2} (P_1 - P_2) V_2$$

$$\Delta U_D = \frac{5}{2} P_1 (V_1 - V_2)$$

$$Q_A = \Delta U_A - W_A$$

$$= \frac{5}{2} (P_1 - P_2) V_1$$

$$Q_B = \frac{5}{2} P_2 (V_2 - V_1) - P_2 (V_2 - V_1)$$

$$= \frac{3}{2} P_2 (V_2 - V_1)$$

$$Q_C = \frac{5}{2} (P_2 - P_1) V_2$$

$$Q_D = \frac{3}{2} P_1 (V_1 - V_2)$$