

57. We use the first law of thermodynamics: $\Delta E_{\text{int}} = Q - W$. The change in internal energy is $\Delta E_{\text{int}} = nC_V(T_2 - T_1)$, where C_V is the molar heat capacity for a constant volume process. Since the process is adiabatic $Q = 0$. Thus, $W = -\Delta E_{\text{int}} = nC_V(T_1 - T_2)$.