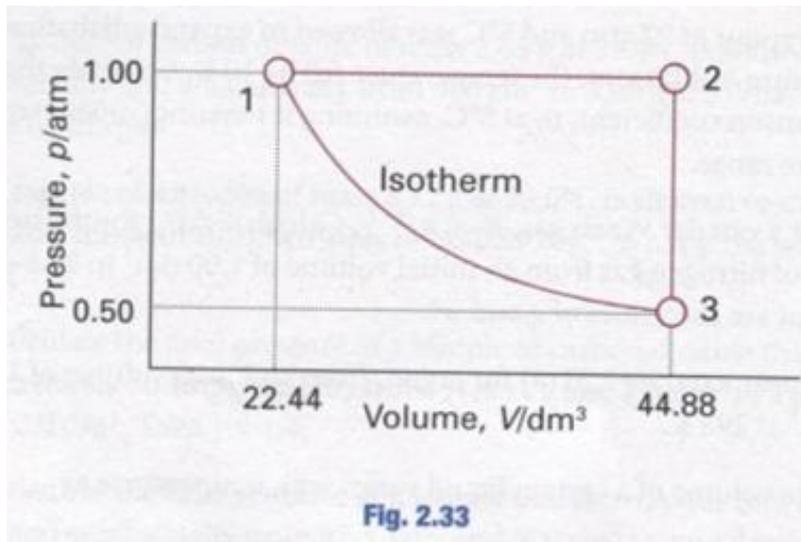


<물리화학 Homework #2>

1. Derive the relation $p_f V_f^\gamma = p_i V_i^\gamma$ (where $\gamma = \frac{C_{p,m}}{C_{v,m}}$) when it's reversible adiabatic expansion of a perfect gas.

2. A sample consisting of 1 mol of perfect gas atoms (for which $C_{v,m} = \frac{3}{2}R$ is) is taken through the cycle shown in Fig. 2.33. (a) Determine the temperature at the points 1, 2, and 3. (b) Calculate q , w , ΔU , and ΔH for each step and for the overall cycle. If a numerical answer cannot be obtained from the information given, then write +, -, 0, or ? as appropriate.



3. A sample of 1.00 mol perfect gas molecules with $C_{p,m} = \frac{7}{2}R$ is put through the following cycle : (a) constant - volume heating to twice its initial pressure, (b) reversible, adiabatic expansion back to its initial temperature, (c) reversible isothermal compression back to 1.00 atm. Calculate q , w , ΔU , ΔH for each step and overall.