[tex7] **Adiabates of the classical ideal gas**

The classical ideal gas is specified by the equation of state $pV = nRT$ and by the internal energy $U = C_V T$ with $C_V = \alpha nR =$ const [$\alpha = \frac{3}{2}$ (monatomic), $\alpha = \frac{5}{2}$ (diatomic), $\alpha = 3$ (polyatomic)].

A reversible process with $S =$ const is called *isentropic* or *adiabatic* and is characterized by the curve $pV^\gamma =$ const.

No heat is exchanged in an adiabatic process: $dU = \delta W$, $\delta Q = 0$. Find γ as a function of α.