

Figure 2.2 A piston-cylinder container for a fluid system is shown. This arrangement permits work to be done on the system when the piston, of cross-sectional area A , is pushed into the cylinder.

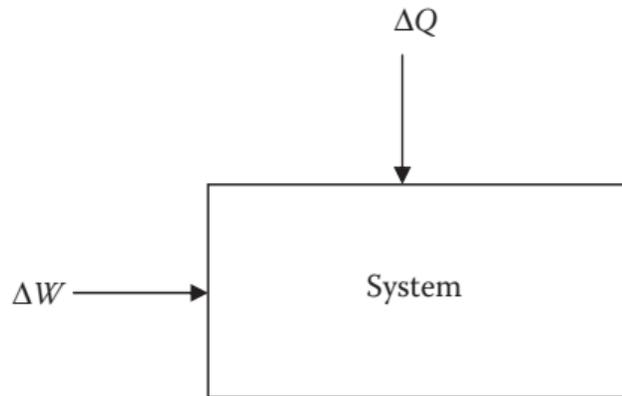


Figure 2.1 An ideal gas system to which heat ΔQ is added and on which work ΔW is done.

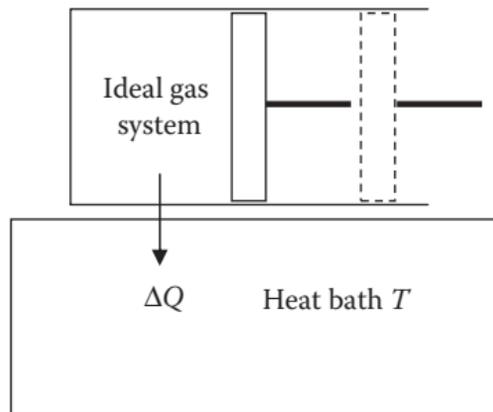


Figure 2.3 Isothermal compression of an ideal gas: heat ΔQ is rejected to the large thermal reservoir, or heat bath, which is maintained at a fixed temperature T .

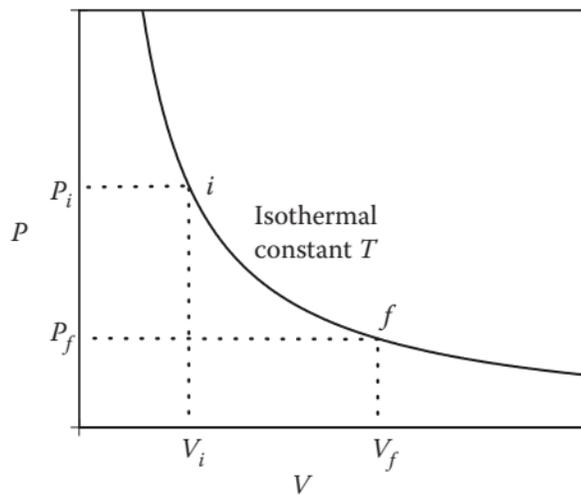


Figure 2.4 P - V diagram for a gas that shows an isothermal expansion process from an initial volume V_i to a final volume V_f .

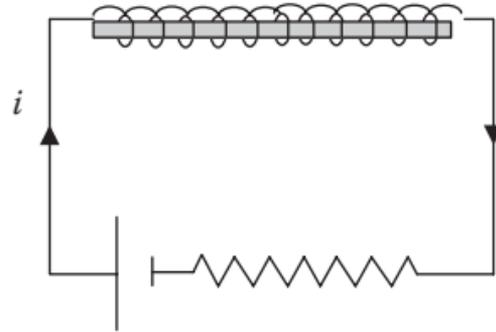


Figure 2.5 A rod of magnetic material is contained in a long solenoid through which a current i is passed.

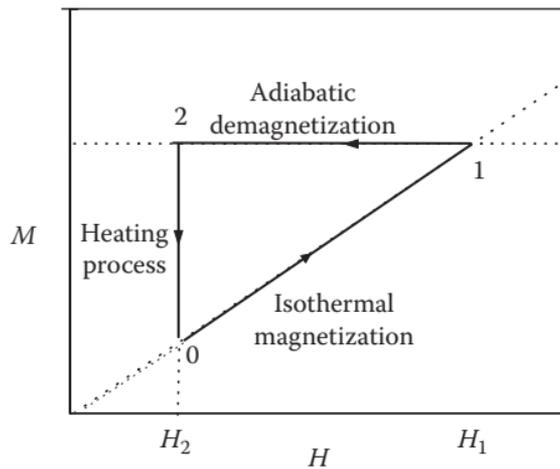


Figure 2.6 M - H diagram for a paramagnetic material that obeys Curie's law. The diagram shows a cycle that is made up of an isothermal magnetization process, an adiabatic demagnetization process, and a heating process at constant H .

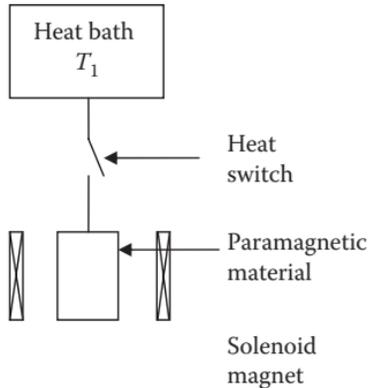


Figure 2.7 A schematic depiction of the arrangement used for magnetic cooling of a paramagnetic material by means of an adiabatic demagnetization process. The material is situated in a field supplied by a magnet. Thermal contact between the paramagnet and the heat bath at a fixed temperature T_1 is controlled by means of a heat switch. With the heat switch open, the applied field is gradually reduced and the temperature of the paramagnet decreases.

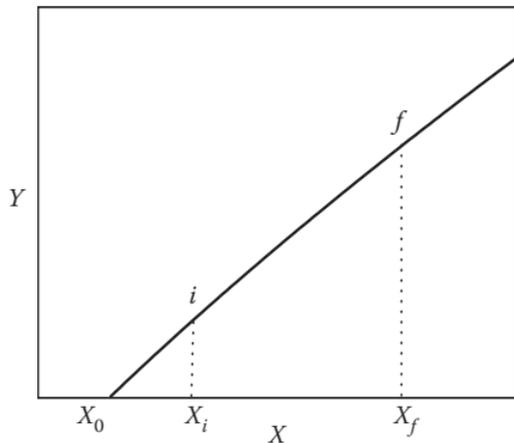


Figure 2.8 The Y - X diagram for a representative work process on some system. The generalized force (intensive variable) Y is plotted versus the generalized displacement (extensive variable) X for the process. X_0 is the value of the variable X for $Y = 0$.

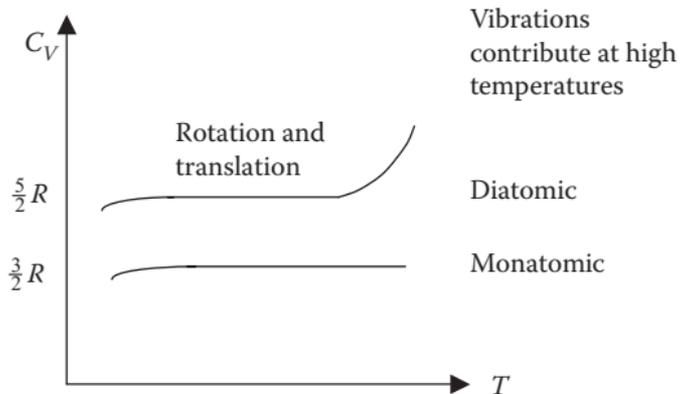


Figure 2.9 Schematic representation of the specific heats of monatomic and diatomic gases as a function of temperature. At sufficiently low T , gases liquefy and/or solidify. At very high temperatures, vibrational motions contribute to the specific heat for diatomic molecules.