

1 Ideal gas calculations

Consider one mole of an ideal monatomic gas at 300K and 1 atm. First, let the gas expand isothermally and reversibly to twice the initial volume; second, let this be followed by an isentropic expansion from twice to four times the original volume.

- (a) How much heat (in joules) is added to the gas in each of these two processes?
- (b) What is the temperature at the end of the second process?
- (c) Suppose the first process is replaced by an irreversible expansion into a vacuum, to a total volume twice the initial volume. What is the increase of entropy in the irreversible expansion, in J/K?