

Practice session IV – Homework

Thermodynamics

1. Calculate the change in entropy when the pressure of a perfect gas is changed isothermally from p_i to p_f . (Given: the pressure occupied by one mole of any perfect gas molecules is doubled at any constant temperature). (Atkins, Page-79)
2. Calculate the entropy change in the surroundings when one mole of N_2O_4 (g) is formed from two moles of NO_2 (g) under standard conditions at 25°C . (Atkins, Page-80)
3. Calculate the entropy change when argon at 25°C and 1 bar in a container of 1 dm^3 is compressed to 0.05 dm^3 and cooled to -25°C . (Atkins, Page-90)
4. The heat of vaporization of water at 100°C is 40.66 kJ/mol . Find S when 5 g of water vapour condenses to liquid at 100°C and 1 atm. (Levine, Page-88)
5. Plot ΔS_{mix} against mole fraction (x_i) of two ideal gases. At what value of x_i is ΔS_{mix} a maximum? Give a physical interpretation of this result. (McQuarrie, Page-634-635)