AS – 5300 Physical Gas Dynamics
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Supplementary Exercise – 2
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1. We start with a box having 1 mole each of CO, O2 and CO2.

(a) What will be the final equilibrium if we allow the gases to come to equilibrium at 300K 1 atm?

(b) Do we always reach this in real life? Explain.

(c) What will be the final equilibrium if the gases are allowed to go to equilibrium at 1000K, 2 atm?

(d) What will be the final equilibrium if the gases are allowed to go to equilibrium at 3000K, 2 atm?

(e) What will be the final equilibrium if the gases are allowed to go to equilibrium at 3000K, 5 atm?

(f) Prove that Le Chatelier's Principle is obeyed by the gases in your system.

{ANS: (a) Xi=[0, 0.2 0.8]; (c) [0,0.2,0.8]; (d) [0.22, 0.29, 0.49]; (e) [0.16, 0.27, 0.57] }

2. We have a system of gases comprising of H2, O2, H, O, OH, H2O. Write the equation required to solve the equilibrium composition of the given system of gases at a given P and T.

3. We have a system of gases comprising of N2, O2, NO, NO2, O, N. Write the equation required to solve the equilibrium composition of the given system of gases at a given P and T.

4. How will you solve the problem if the system in q3 is taken from a particular pressure 'P1' to a new pressure 'P2' through external work, keeping the temperature 'T' the same?