

## Answers to Equilibrium Problems Assignment I & II

### Calculations Assignment I:

1.  $K_c = 0.0185$
2.  $K_c = 6.73$
3.  $[\text{HI}] = 0.315 \text{ M}$
4.  $[\text{H}_2] = 0.0053\text{M}$ ,  $[\text{CO}_2] = 0.0053\text{M}$ ,  $[\text{H}_2\text{O}] = 0.0047\text{M}$ ,  $[\text{CO}] = 0.0047 \text{ M}$
5.  $[\text{H}_2] = 0.47\text{M}$
6.  $Q = 4.96$  therefore.. a) not at equilibrium, b) will proceed towards the left (reactants)
7.  $[\text{H}_2\text{O}] = 0.068$
8.  $[\text{CO}] = 0.0332 \text{ M}$ ,  $[\text{H}_2\text{O}] = 0.0332$ ,  $[\text{CO}_2] = 0.0668$ ,  $[\text{H}_2] = 0.0668$
9. a)  $[\text{PCl}_5] = 0.0178 \text{ M}$  b) 1.85 g

### Calculations Assignment II:

1. a)  $K = 0.73$  b)  $K = 0.028$
2. b)  $K_c = 9$  c)  $[\text{A}] = 0.5\text{M}$ ,  $[\text{B}] = 0.5 \text{ M}$ ,  $[\text{C}] = 1.5\text{M}$ ,  $[\text{D}] = 1.5\text{M}$
3.  $[\text{A}] = 0.13\text{M}$ ,  $[\text{B}] = 0.13 \text{ M}$ ,  $[\text{C}] = 0.27 \text{ M}$ ,  $[\text{D}] = 0.27\text{M}$
4.  $Q = 114.28$  therefore... a) not at equilibrium b) will proceed towards the left (reactants)
5.  $[\text{NH}_3] = 0.1 \text{ M}$
6.  $K$  is too small,  $[\text{CO}]$  will be approximately 0
7.  $K$  is too small,  $[\text{H}_2]$  will be approximately 0
8.  $[\text{HBr}] = 0.038 \text{ M}$ ,  $[\text{Br}] = 0.0116 \text{ M}$ ,  $[\text{H}_2] = 0.0116 \text{ M}$
9.  $[\text{C}_2\text{H}_5\text{OH}] = 0.33 \text{ M}$