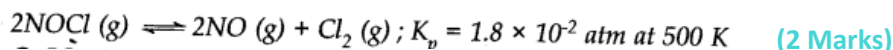




SARVANSIR- CHEMISTRY FOR ALL

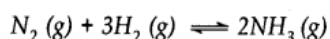
Chapter Test | Chemistry XI | Equilibrium I Time: 2 H | Marks- 40

Q.1. Find the value of K_c for each of the following equilibria from the value of K_p



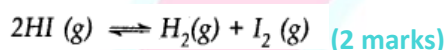
Q.2. For the following equilibrium, $K = 6.3 \times 10^{14}$ at 1000 K. $NO(g) + O_3 \rightarrow NO_2(g) + O_2(g)$ Both the forward and reverse reactions in the equilibrium are elementary bimolecular reactions. What is K_c for $2NO_2(g) + 2O_2(g) \rightarrow 2NO(g) + 2O_3(g)$ (2 Marks)

Q.3. Reaction between nitrogen and hydrogen takes place as follows:

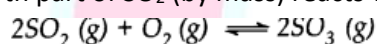


If a mixture of 0.542 mol of N_2 and 0.933 mol of H_2 is placed in a reaction vessel of volume 10 L and allowed to form NH_3 at a temperature for which $K_c = 2.0 \times 10^{-37}$, determine the composition of the equilibrium mixture (3 Marks)

Q.4. A sample of $HI(g)$ is placed in a flask at a pressure of 0.2 atm. At equilibrium partial pressure of $HI(g)$ is 0.04 atm. What is K_p for the given equilibrium?



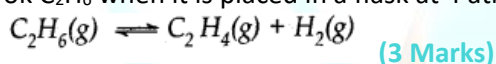
Q.5. If 1 mole of SO_2 and 1 mole of O_2 are taken in a 10 liter vessel and heated, at equilibrium point 1/5th part of SO_2 (by mass) reacts with O_2 according to equation.



Calculate the equilibrium constant for the reaction.

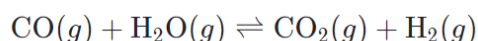
(3 Marks)

Q.6 $K = 0.04$ atm at 898 K for the equilibrium shown below. What is the equilibrium concentration of C_2H_6 when it is placed in a flask at 4 atm pressure, and allowed to come to equilibrium?



Q.7. Given the following concentrations, what is Q_c ?

And, if $K = 1.0$, which side of the reaction is favored at that value of Q_c



$$[CO(g)] = [H_2O(g)] = 1.0 \text{ M}$$

$$[CO_2(g)] = [H_2(g)] = 15 \text{ M}$$

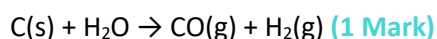
(2 Marks)

Q.8. Which of the following will cause an equilibrium shift in an exothermic reaction towards the products?

I. Decreasing the temperature

II. Evaporating the product (2 Marks)

Q.9. In what manner will increase of pressure affect the following equation





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Q.10. For a reversible reaction the concentration of the reactants are doubled, then the equilibrium constant (1 Mark)

- a) becomes one-fourth
- b) is doubled
- c) is halved
- d) remains the same

Q.11. The species H_2O , HCO_3^- , HSO_4^- and NH_3 can act both as Bronsted acid and base. For each case, give the corresponding conjugate acid and base. (4 Marks)

Q.12. Define Buffer solution and types with example (3 Marks)

Q.13. The ionization constant of phenol is 1.0×10^{-10} . What is the concentration of phenolate ion in 0.05 M solution of phenol? What will be its degree of ionization if the solution is also 0.01 M in sodium phenolate? (3 Marks)

Q.14. (i) Point out the differences between ionic product and solubility product.

(ii) The solubility of AgCl in water at 298 K is 1.06×10^{-5} mole per litre. Calculate its solubility product at this temperature. (3 Marks)

Q.15. If the solubility product constant of barium fluoride is 2.4×10^{-5} M, what is the solubility of barium fluoride? (3 Marks)

Q.16. Assuming complete dissociation, calculate the pH of the following solutions:

(a) 0.003 M HCl (b) 0.005 M NaOH (3 Marks)

Chemistry for all