Second Unit Test in CHEMISTRY

Std. 11   Time : 1 hr.
01-12-2015   M. Marks: 20

1.   Differentiate between Oxidation Number and Valency. (two points)   (1)

2.   The concentration of hydrogen ion in a sample of soft drink is 3.8×10^{-3}. What is its pH? (1)

3.   What is common –ion effect? Give an example.   (1)

4.   What is salt bridge? What is its function?   (1)

5.   Find the conjugate acid /conjugate base for the following species: F^- and HS^-.   (1)

6.   Balance the following reaction:
         $Cr_2O_7^{2-}(aq) + SO_3^{2-}(aq) \rightarrow Cr^{3+}(aq) + SO_4^{2-}(aq)$ (acidic medium)   (2)

7.   At 600K, the equilibrium constant Kc for the reaction, $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$
         is 0.27mol/L. Calculate Kp for the reaction at the same temperature.
         (R = 0.0821 L / atm / mol)   (2)

8.   a)   Write the mathematical expression for Ostwald's dilution law.
         b)   State Le Chatelier's Principle. Predict the effect of temperature and pressure, to
                  get good yield of SO_3 in the reaction. $2SO_2 (g) + O_2 (g) \rightleftharpoons 2SO_3 (g)$. ΔH = −198kJ.

                                                                                                                                                      (2)

9.   A mixture of 1.57 mol of N_2, 1.92 mol of H_2, and 8.13 mol of NH_3 is introduced into a
         20L reaction vessel at 500K. At this temperature, the equilibrium constant Kc for the
         reaction, $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ is 1.7×10^2. Is this reaction mixture at equilibrium?
         If not, what is the direction of the net reaction?   (2)

10.   The solubility product of   silver chloride at 298K is 1.2×10^{-10}. Find out its solubility
         at this temperature.   (2)

11.   a)   Equilibrium is dynamic in nature. Explain.
         b)   Ionisation constant of acetic acid is 1.74×10^{-5}.Calculate the degree of
                  dissociation of acetic acid if the concentration is 0.05M.   (2)

12.   a)   The standard electrode potentials of a few metals are given below:
                  Al(−1.66), Cu(+0.34), Li (−3.05V), Ag(+0.80V) and Zn(−0.76V).Which of these will
                  behave as the strongest oxidizing agent and which as the strongest reducing agent?

         b)   A cell is prepared by dipping a copper rod in 1M $CuSO_4$ solution and a nickel rod in

1M NiSO$_4$ solution. The standard reduction potentials of Cu and Ni electrodes are +0.34V and −0.25V respectively.

i)   Which electrode will work as anode and which as cathode?
ii)   What will be the cell reaction?
iii)   How is the cell represented?
iv)   Calculate the EMF of the cell.   (1+2)

-x-x-x-x-x-x-