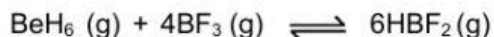
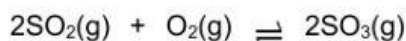


23. Equilibrium constant,  $K_p$ , for the equilibrium



is 2.94 at 296K. What is the value of equilibrium constant,  $K_c$  for this equilibrium at the same temperature?

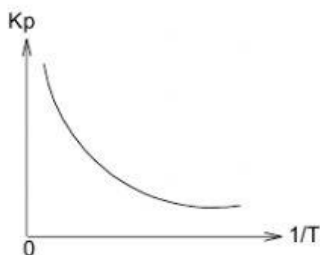
- A.  $0.121 \text{ mol L}^{-1}$       C.  $71.4 \text{ mol L}^{-1}$   
 B.  $8.26 \text{ mol L}^{-1}$       D.  $2.94 \text{ mol L}^{-1}$
24. The formation of Sulphur trioxide gas  $\text{SO}_3$  is given as:



Initially, 2 mol of Sulphur dioxide gas,  $\text{SO}_2$  and 1 mol of oxygen gas,  $\text{O}_2$  is placed in 1.0 L flask. At equilibrium, 57% of oxygen was completely reacted. Calculate the percentage of Sulphur trioxide,  $\text{SO}_3$  at equilibrium.

- A. 50.5%      C. 75%  
 B. 46.9%      D. 63%

25. The graph below shows the effect of temperature, T on the equilibrium constant,  $K_p$  for the reaction



Which of the following statements about the reaction is true

- A. The forward reaction is endothermic.  
 B. The forward reaction is exothermic  
 C. At high temperature, the amount of Z in the equilibrium mixture decreases.  
 D. At higher Temperature,  $K_p$  increase.
26. An aqueous solution of a weak acid,  $\text{HX}$ , is prepared by dissolving 0.020 mol of  $\text{HX}$  in water to yield 1.0L of solution. At  $25.0^\circ\text{C}$ ,

the pH of the solution was 4.93. Calculate the  $K_a$  value for  $\text{HX}$ .

- A.  $1.37 \times 10^{-10}$       C.  $1.17 \times 10^{-5}$   
 B.  $6.85 \times 10^{-9}$       D.  $5.85 \times 10^{-4}$
27. Calculate the pH of a 0.02M solution of  $\text{Ca}(\text{OH})_2$  at  $25^\circ\text{C}$
- A. 0.04      C. 1.69  
 B. 1.40      D. 12.6
28. Choose the **CORRECT** statement regarding buffer solutions
- A. A buffer capacity is the pH of a buffer after mixing an acid and base pair in limited amount.  
 B. A buffer made from strong acid and strong base is normally able to resist changes in pH better.  
 C. A buffer solution made from  $\text{NH}_3$  and  $\text{NH}_4\text{Cl}$  pair will have pH in the acid range.  
 D. A buffer is characterized by its pH, and its buffer capacity upon the addition of small amounts of strong acid or strong base.
29. If the molar solubility of  $\text{PbBr}_2$  is  $0.01 \text{ mol L}^{-1}$ , what is the solubility constant,  $K_{sp}$ ?
- A.  $4.0 \times 10^{-6} \text{ mol}^3 \text{ L}^{-3}$   
 B.  $4.0 \times 10^{-6} \text{ mol}^2 \text{ L}^{-2}$   
 C.  $3.0 \times 10^{-6} \text{ mol}^3 \text{ L}^{-3}$   
 D.  $1.0 \times 10^{-6} \text{ mol}^3 \text{ L}^{-3}$
30. Choose the **CORRECT** statement(s) regarding 0.0010M  $\text{NH}_3$  solution. [ $K_b \text{ NH}_3 = 1.8 \times 10^{-5}$ ]
- A. The concentration of  $\text{NH}_4^+$  is  $4.24 \times 10^{-4} \text{ M}$   
 B. The concentration of  $\text{H}^+$  is  $7.46 \times 10^{-11} \text{ M}$   
 C. pOH of the solution is 10.13  
 D. pH of the solution is 3.8

**END OF QUESTION PAPER.**