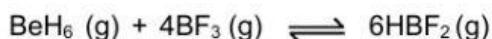


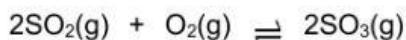
23. Equilibrium constant,  $K_p$ , for the equilibrium



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

A. 0.121 mol L<sup>-1</sup>    C. 71.4 mol L<sup>-1</sup>  
 B. 8.26 mol L<sup>-1</sup>    D. 2.94 mol L<sup>-1</sup>

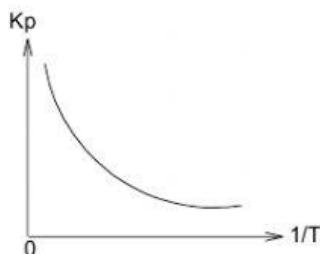
24. The formation of Sulphur trioxide gas  $\text{SO}_3$  is given as:



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°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°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 0.01mol L<sup>-1</sup>, 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.  $[\text{K}_b \text{ NH}_3 = 1.8 \times 10^{-5}]$

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.**