## CHEMBUDDY CHAPTER 6
## 6.2 EQUILIBRIUM CONSTANT

**CHOOSE THE CORRECT ANSWER**

| NO | QUESTION | NO | QUESTION |
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| 1 | Kp for the reaction<br>$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ + heat<br>at 400°C is $1.64 \times 10^{-4}$. Calculate Kc.<br>A. 0.30 C. 0.50<br>B. 0.40 D. 0.60 | 2 | One mole of $SO_3$ was placed in a one litre reaction flask at a given temperature.<br>$2SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$<br>When the reaction equilibrium was established in the reaction, the vessel was found to contain 0.6 mole of $SO_2$. The value of equilibrium constant is<br>A. 0.360 C. 0.450<br>B. 0.675 D. 0.540 |
| 3 | The value of Kc at 700°C for the equilibrium<br>$SO_2(g)+NO_2(g) \rightleftharpoons SO_3(g)+NO(g)$<br>is 9.01. Calculate the value of Kp at the same temperature.<br>A. 10.0 C. 1.09<br>B. 0.19 D. 9.01 | 4 | Calculate the value of Kp for the system<br>$CaCO_3(s) \rightleftharpoons CaO(s)+CO_2(g)$<br>At 525°C, with the equilibrium pressure of $CO_2$ at 0.22atm.<br>A. 3.36 C. 0.08<br>B. 0.22 D. 0.79 |
| 5 | At a certain temperature, the equilibrium constant, Kc for the reaction<br>$2XY(g) \rightleftharpoons X_2(g)+Y_2(g)$<br>is 25. What is the equilibrium constant, Kc for the reaction below?<br>$\frac{1}{2} X_2(g)+1/2Y_2(g) \rightleftharpoons XY(g)$<br>A. 5 C. 12.5<br>B. 1/25 D. 1/5 | 6 | Consider the following reaction at 400K.<br>$PCl_5(g) \rightleftharpoons PCl_3(g)+Cl_2(g)$<br>At equilibrium, the following concentration were obtained:<br>$[PCl_5]=0.042M$, $[PCl_3]=1.25M$, and $[Cl_2]=0.4M$<br>What is the value of Kp for the reaction?<br>A. 0.084 C. 11.90<br>B. 0.363 D. 390.6 |

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| 7 | . At 25°C, the decomposition of $N_2O_4$ has a Kp value of 0.14.<br>$N_2O_4(g) \rightleftharpoons 2NO_2(g)$<br>If the partial pressure of NO at equilibrium is 0.15 atm, what is the partial pressure of $N_2O_4$ in the mixture?<br>A. 0.0032 atm C. 0.16 atm<br>B. 0.15 atm D. 1.07 atm | 8 | At 25°C, the value of Kp for the reaction<br>$2NO_2(g) \rightleftharpoons N_2O_4(g)$<br>is 7.13. At equilibrium, the partial pressure of $NO_2$ in a container is 0.15atm. what is the partial pressure of $N_2O_4$ in the mixture?<br>A. 7.13 C. 0.16<br>B. 0.15 D. 0.17 |
| 9 | For the Haber process<br>$N_2(g)+3H_2(g) \rightleftharpoons 2NH_3(g)$<br>$Kp=1.45x10^{-5}$ atm at 500°C<br>In an equilibrium mixture of the three gasses, the partial pressure of $H_2$ is 0.928 atm and that of $N_2$ is 0.432 atm. What is the partial pressure of $NH_3$?<br>A. 0.432 C. $1.45x10^{-5}$<br>B. 0.928 D. $2.24x10^{-3}$ | 10 | A mixture of gases is allowed to reach equilibrium at 700°C in a 12.0L flask. At equilibrium, the mixture contains 0.208M $SO_2$, $1.12x10^{-6}$ M $O_2$ and 0.725 M $SO_3$.<br>$2SO_2(g)+O_2(g) \rightleftharpoons 2SO_3(g)$<br>What is equilibrium constant, Kc?<br>A. $9.22x10^{-8}$ C. $1.08x10^{7}$<br>B. $3.11x10^{6}$ D. $4.56x10^{8}$ |
| 11 | The value of Kc for the reaction;<br>$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$<br>is 50.2 at 450°C. If at the same temperature, $[H_2] = [I_2] = [HI] = 1.75X10^{-3}$ M, which of the following statement is **TRUE**?<br>A. The system is at equilibrium.<br>B. HI concentration increases when the system re-establishes equilibrium.<br>C. Concentration $H_2$ and $I_2$ increase as the system re-establishes equilibrium.<br>D. Concentration HI and $I_2$ increase as the system re-establishes equilibrium. | 12 | . Consider the following reaction<br>$2NaHCO_3(s) \rightleftharpoons Na_2CO_3(s) + CO_2(g) + H_2O(g)$<br>Kp = 0.23<br>A sample of $NaHCO_3$ is placed in an evacuated flask and is allowed to achieve equilibrium at 373K. What is the total gas pressure at equilibrium?<br>A. 0.12 atm C. 0.48 atm<br>B. 0.24 atm D. 0.96 atm |