

AP Chemistry – Unit 05 Drill Review – 50

Name _____ Per ____

1. For the reaction $2\text{H}_2\text{O} \leftrightarrow 2\text{H}_2 + \text{O}_2$ there is 0.180 M H_2O initially with no products. At equilibrium there is 0.152 M H_2 . Calculate the value of K_c .

2. For the reaction $2\text{COF}_2 \leftrightarrow \text{CO}_2 + \text{CF}_4$ the value of K_c is 0.417. At equilibrium there is 0.489M COF_2 , and 0.382 M CF_4 . What is the equilibrium concentration of CO_2 ?

3. For the reaction $\text{CH}_3\text{OH} \leftrightarrow \text{CO} + 2\text{H}_2$ the value of K_c is 0.0781. If a reaction mixture has 0.446M CH_3OH , 0.345M CO and 0.149M H_2 , what is the value of Q and which way does the reaction need to proceed to reach equilibrium?

4. For the reaction $\text{CS}_{2(g)} + 4\text{H}_{2(g)} \leftrightarrow \text{CH}_{4(g)} + 2\text{H}_2\text{S}_{(g)}$ the value of K_c is 1.17 and the temperature is 312K. What is the value of K_p ?

5. If the pOH of a solution is 11.39, what is the pH, $[H^+]$ and $[OH^-]$?

6. What is the pH of a .0700M solution of formic acid ($K_a = 1.80 \times 10^{-4}$)? Calculate the pH using the weak acid approximation and the quadratic equation. Show all of your work.

7. A buffer has a pH of 3.64 and a cyanate concentration $[OCN^-]$ of 0.51M. What is the cyanic acid HOCN concentration ($pK_a = 3.46$)?