

chemistry

Name;_____

chemistry work sheet

Grade 11 .section- _____

Max. mark ;10%

Subject ; chemistry

1)Answer the following quitions accordingly.

1.Describe the characteristics of chemical reactions at equilibrium.

2.The reaction for the formation of nitrosyl chloride $2\text{NO}(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons 2\text{NOCl}_2(\text{g})$ was studied at 25°C is $1.9 \times 10^{-3} \text{ atm}^{-1}$. What is the value of K at 25°C ?

3. Three gases are in equilibrium in a closed chamber sealed. The following equilibrium is established;
 $2\text{NH}_3(\text{g}) \rightleftharpoons \text{N}_2(\text{g}) + 3\text{H}_2(\text{g})$. What will happen if the piston is pushed into the chamber?

4.What are the factors that increase the amount of $\text{SO}_3(\text{g})$ at equilibrium?



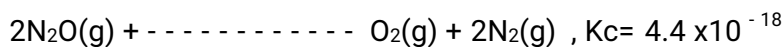
5. In the reaction ; $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3$, K eq = 100, what will be the concentration of O_2 , if the concentration of SO_2 is the same as SO_3 ?

6. Write the conventional equilibrium constant expression for $2\text{I}(\text{s}) \rightleftharpoons \text{I}_2(\text{s}) + \text{Cl}_2(\text{g})$.

7.A 0.1 M solution of HCl is dissolved in water. What species of ions are present at equilibrium ,and what will be their equilibrium concentrations?

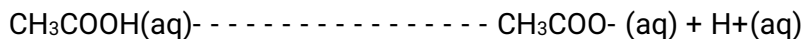
8. The value of K_{eq} for the following reaction is 0.25. $\text{SO}_2(\text{g}) + \text{NO}_2(\text{g}) \rightleftharpoons \text{SO}_3(\text{g}) + \text{NO}(\text{g})$. What is the value of K_{eq} at the same temperature of the reaction $2\text{SO}_2(\text{g}) + 2\text{NO}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) + 2\text{NO}(\text{g})$?

9.The following equilibrium constants were determined at 300°C .

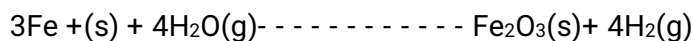


$\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$, $K_c = 4.0 \times 10^{-31}$, what will be the equilibrium constant at 300°C for the gaseous reaction of ; $2\text{N}_2\text{O}(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 4\text{NO}(\text{g})$?

10.In which direction will the following equilibrium shift , if a solution of CH_3COONa is added?



11.Write yhe equilibrium constant expression , K_c, for the reaction below.

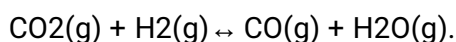


12.Suppose $K_c = 0.25$ for the reaction $\text{CO}(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons \text{CH}_4(\text{g}) + \text{H}_2\text{O}(\text{g})$. If this equation is rewritten as follows, what will be the new K_c value at the same temperature? $1/2\text{CH}_4(\text{g}) + 1/2\text{H}_2\text{O}(\text{g}) \rightleftharpoons 1/2\text{CO}(\text{g}) + 3/2\text{H}_2(\text{g})$.

13. Chemical equilibrium is a dynamic (not a static) system. Explain.

14. For the following reaction at 373K , $k = 0.36$. If the initial concentration of N_2O_4 is 0.100M , what is the equilibrium concentration of NO_2 ? $\text{N}_2\text{O}_4 \rightleftharpoons 2\text{NO}_2$.

15. At equilibrium a mixture contained $0.235\text{M}[\text{CO}_2]$, $0.339\text{M}[\text{H}_2]$, $0.115\text{M}[\text{CO}]$, and $0.210\text{M}[\text{H}_2\text{O}]$. Calculate K_p.



16. A reaction mixture initially contains 0.25M (CO) and 0.400M(O₂). At equilibrium, the concentration of CO₂ is 0.15M. Calculate K_c.

17. Two moles of PCl₅ were heated to 327 °C in a closed two liter vessel and when equilibrium was established PCl₅ was found to be 40% dissociated into PCl₃ and Cl₂. Calculate the equilibrium constant, K_c and K_p for this reaction.

II) Match terms listed under in column A with their description listed under column B.

<u>Column- A</u>	<u>column -B</u>
18. Equilibrium position	A. used to determine whether a reaction has Equilibrium.
19. Law of chemical equilibrium	B. depends on the initial concentrations of the substances The reaction.
20. Reaction quotient	C. states that every reaction proceeds to an equilibrium State with a specific K _{eq} .
21. Law of mass action	D. expresses the relative concentration of reactants and Products at equilibrium in terms of an equilibrium Constant.
22. Equilibrium constant	E. the ratio of product concentration to reactant Concentration at equilibrium.
23. $Q/k > 1$	F. reactants $\leftarrow$ products
24. $Q/k < 1$	G. reactants $\rightarrow$ products