

SUCCESS KEY TEST SERIES

Work Sheet

Std: 11th Science

Subject: Chemistry

Time: 1Hrs

Date :

12. Chemical Equilibrium

Max Marks: 35

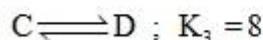
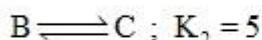
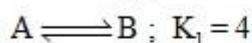
Q.1 Select and write the most appropriate answers from given alternatives:

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1) Reverse reaction in chemical equilibrium is favoured by

- (a) increasing the concentration of the reactant.
- (b) removal of at least one of the products at regular intervals.
- (c) increasing the concentration of one or more of the products.
- (d) addition of catalyst.

2) For the hypothetical reactions, the equilibrium constant (K) values are given



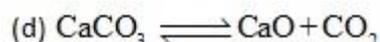
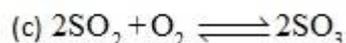
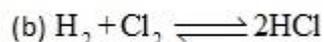
The equilibrium constant (K) for the reaction is $A \rightleftharpoons D$

3) The equilibrium constant (K_p) for the reaction is 16. If the volume of the container is reduced to one-half of its original volume, the value of K_p for the reaction at same temperature will be

Options:

- (a) 4 (b) 16
- (c) 32 (d) 64

4) The value of K_p is less than K_c in the reaction



5) The concentration of the reactants is increased by Y, then the equilibrium constant K becomes

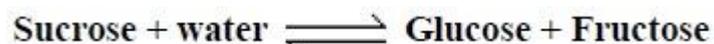
Options:

- (a) In K/Y (b) K/Y (c) $K+Y$ (d) K

Q.2 Answer the following very short questions:

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1) Hydrolysis of sucrose gives,



Equilibrium constant, K_c for the reaction is 3×10^{11} at 300 K. Calculate G at 300 K

- 2) What does a greater rate constant for forward reaction than a reverse reaction suggests about the completion of the reaction?
- 3) State the condition in which a catalyst does not appear.
- 4) State the factors which influence the Le Chatelier's Principle
- 5) Identify forward and reverse reaction in terms of endothermic and exothermic reactions.

Q.3 Answer the following Questions:**10**

- 1) Explain: Reversible reaction
- 2) Write expressions of K_c for following chemical reactions
 - (i) $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$
 - (ii) $\text{N}_2\text{O}_4(\text{g}) \rightleftharpoons 2\text{NO}_2(\text{g})$
- 3) Derive mathematically value of K_p for
for $\text{A}(\text{g}) + \text{B}(\text{g}) \rightleftharpoons \text{C}(\text{g}) + \text{D}(\text{g})$
- 4) The value of K_c for the dissociation reaction $\text{H}_2(\text{g}) \rightleftharpoons 2\text{H}(\text{g})$ is 1.2×10^{-42} at 500K. Does the equilibrium mixture contain mainly hydrogen molecules or hydrogen atoms ?
- 5) The equilibrium constant K_c for the reaction of hydrogen with iodine is 54.0 at 700 K.

Q.4 Answer the following Questions:**15**

- 1) Relate the terms reversible reactions and dynamic equilibrium.
- 2) Write suitable conditions of concentration, temperature and pressure used during manufacture of ammonia by Haber process.
- 3) For the equilibrium $\text{BaSO}_4(\text{s}) \rightleftharpoons \text{Ba}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq})$, state the effect of
 - (a) Addition of Ba^{2+} ion.
 - (b) Removal of SO_4^{2-} ion
 - (c) Addition of $\text{BaSO}_4(\text{s})$ on the equilibrium
- 4) Differentiate irreversible and reversible reaction.
- 5) (i) If NH_3 is added to the equilibrium system, in which direction will the equilibrium shift to consume added NH_3 to reduce the effect of stress?
(ii) In this process, out of the reactions (reverse and forward reaction), which reaction will occur to a greater extent ?
(iii) What will be the effect on yield of NH_3 ?

----- All the Best -----