

13/11/20

CLASS - XI
2nd Mid term

F.M - 50
TIME - 1 1/2 hrs

D 1) State and explain Le-Chatelier's principle ①

2) On the basis of this principle derive the optimum conditions for the formation of NH_3 from N_2 and H_2 ②

3) Prove that the pressure necessary to obtain 50% dissociation of PCl_5 is numerically three times the value of K_p ②

2) 1) State and explain Law of mass action ①

2) Derive a relationship between K_p & K_c , and K_p and K_x with this expression ②

3) Find out the effect of inert gas in the rate of a chemical reaction ②

4) Equilibrium constant K_c for the reaction $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$ at 500K is 0.061. Composition of the reaction mixture is $3.0 \text{ mol L}^{-1} \text{ N}_2$, $2.0 \text{ mol L}^{-1} \text{ H}_2$ and $0.5 \text{ mol L}^{-1} \text{ NH}_3$ is the reaction at equilibrium? If not in which direction does the reaction tend to proceed to reach equilibrium ②

3) 1) Define solubility and Solubility product? ①

2) State and explain common ion effect with proper example. ②

3) 50 ml of 0.01(M) solution of $\text{Ca}(\text{NO}_3)_2$ is added to 150 ml of 0.08M solution of $(\text{NH}_4)_2\text{SO}_4$ predict whether CaSO_4 will be precipitated or not ②
 K_{sp} of $\text{CaSO}_4 = 4 \times 10^{-5}$

4) 1) State and explain Hybridization ①

2) Write down the hybridization of the following compound with diagram ⑩

C_2H_2 , XeF_4 , SF_6 , H_2O , NH_3

3) Why mobility of H^+ ions in ice is greater as compared to liquid H_2O ②

4) ClF_3 exists why FCl_3 does not ①

5) BCl_3 is planar but anhydrous AlCl_3 is tetrahedral ①

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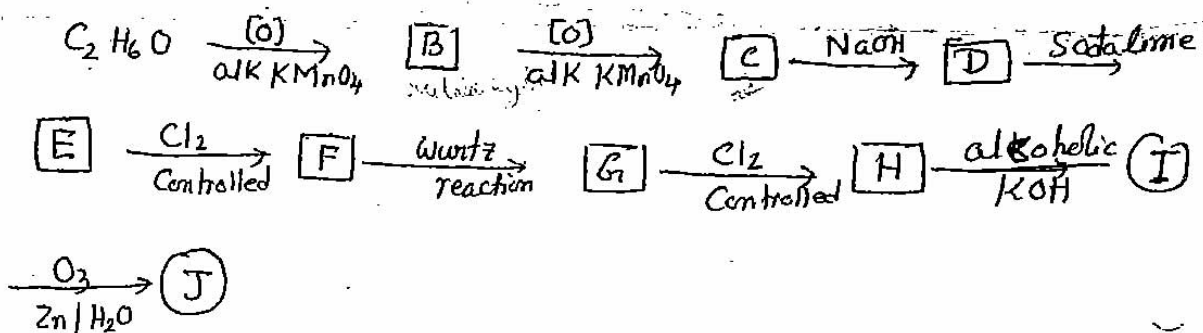
Organic

Convert the following

(any 5)

- (1) Acetylene to acetone $C \equiv C \rightarrow CH_3COCH_3$
- (2) Ethane to acetylene $C_2H_6 \rightarrow C \equiv C$
- (3) Ethane to glycol
- (4) Ethene to glyoxal $C_2H_4 \rightarrow O=C-C=O$
- (5) Ethane to tertiary butyl alcohol
- (6) propene to Glycerol

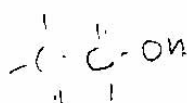
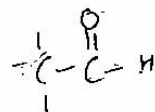
(B) An organic compound (A) with molecular formula C_2H_6O undergoes the following changes identify all the compound A-J and complete the table



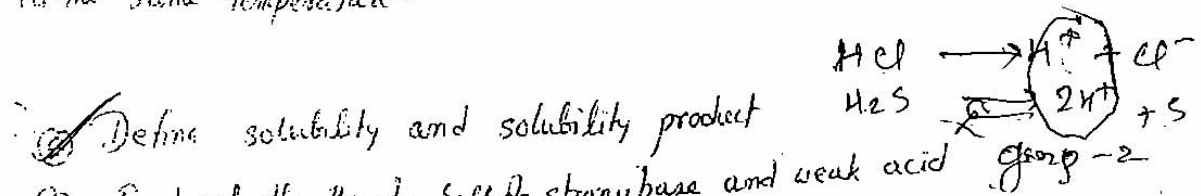
(C)

X

X



25 ml of H_2 and 15 ml of I_2 when heated in a closed container produced 20 ml of HI at equilibrium calculate the degree of dissociation of HI at the same temperature.



(b) Find out the pH of salt of strong base and weak acid

(c) How many moles of $HgBr$ $K_{sp} = 5 \times 10^{-13} [mole^2 L^{-2}]$ will dissolve in a 0.01 (M) $NaBr$ solution.

(5) State and explain Buffer solution with an example of Basic Buffer.

(b) 50 ml of 0.01 (M) solution of $Ca(NO_3)_2$ is added to 150 ml of 0.08 (M) solution of $(NH_4)_2SO_4$ predict whether $CaSO_4$ will be precipitated or not

$[K_{sp} \text{ of } CaSO_4 = 4 \times 10^{-5}]$

$$[50] + [150] \rightarrow [200]$$

(6) State and explain 1st law of thermodynamics

(b) Find out a relationship between ΔH & ΔU

(c) The heats of combustion of NH_3 and H_2 are 9.06 and 68.9 kcal respectively calculate the heat of formation of NH_3