	TIMU		
	The state of the s	Page:	
	CHEMICAL EQUILIBRIUM:	Date: / /	
	Equilibrium:	chyta 1 2	
حاد	It is a state of reversible reaction	in which there	
	is no change in the properties of the	ne system.	
	OR,		
	It is the state of reversible reaction		
	forward reaction becomes equal to r.		
- E 0	reaction. It involves two opposing	rocess	
3.7	If the opposing process involves p	hysical Changes	
- and	then equilibrium is called physical equi	เล็กเลา	
	If the opposing process involves there	nical Changes	
	then equilibrium is called chemical equilibrium.		
	2 X 3 1 1 1 1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3	Se Billian Millian	
#	Physical equilibrium-		
	Carron Times Contract Comes.		
	Liquid - Vapour equilibrium:		
1	iquid - vapour system in a closed	Vessel at Constant	
117	emperature is a good grande of c	hysical equilibrium.	
14.103	Equal in the rain of Caplensa		
	HOD EVAPORATION	of dations	
) नामके । (भी	
1100		- to 0, a 1	
Mes	e, two opposing process are eva	poration & Conden	
	ition, When the rate of evapo	oration is equal	
10		librium is reached.	
M.E.H.	10 1- of the cook - to record of leges	(2morad	
		lames in the	

H	Date: / /
100	
	Solid-Liquid equilibrium:
	A mixture of ice & water at o'c & 1 witm.
1	pressure in a perfectly insulated
-	Solid-liquid equilibrium.
	melting , 40
	H20: 1120
1 1 1 1 1	The state of the s
	Here, two opposing process involved are melting
11:00	tracted talles they rate of military
	becomes equal to rate of freezing of water, then
2090	equilibrium is reached.
- 1 19	Intelliging to seconds there are importationed and
(111)	Solid-gas equilibrium:
	Sublimation Suppor
	Camphon Tondensation (g)
	(a) manufacture of the second
He He	re, two opposing process involved are sublimation
a	Condengation when the rate of Sublimation
be	comes equal to the rate of Condensation, then
1100	juilibrium is reached.
(iv) so	olute - solution equilibrium:
11	
12 3	Nacl deposition (as)
Her	e, two opposing mocess involved are discolu-
Lion	Nacl deposition Nacl deposition (ag) e, two opposing process involved are dissolution deposition. When the rate of dissolution mes equal to pate of deposition then equilibrium
beco	mes equal to rate of deposition then eavilibrium
15	reached.

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Date:	/	1	

Chatelier's principle & Law

of man action.

		viate: / /
#	Differentiate between rever	sible & groversible reaction:
i- , i-,	Reversible reaction	Interestible reaction
	i) The reaction In which reaction	3 The reaction In which reactants
	ts react to give product &	react to give product but product
,	Vice-versa under Suitable Cond-	don't react to a eve reactant is
	Prion is called reversible reaction.	Called irreversible reaction.
	ii) It maintains equilibrium.	i) It doesn't maintain equilibrium.
-	नाएकर्म १६७३मा व्याहरू	
•	in It is donoted by double head	in it is donoted by single
. 0	arrow. i.e., =	head arrow. He,
		BAY I
-	is It takes place in both	in It takes place in only
	directions Discoursed	one direction.
1	STUDING THAT REACTOR WENCE	21/2 - 21/2 - 22/2 - 10/1 N
	VI It follow le-chatelier's	V) TH doosn't follow 10-

Law of mass. action!

reacts is directly proportional to its active mass.

and the vate of chemical reaction is directly proportional to product of active masses of the reaction."

Active mass is represented by writing the species

	Page: Date: / /
	inside square bracket ([]) or some times by a.
	The teem active mass means molar concentration i.e. number of moles per Litre volume.
2	f.e. no. of moles(n) C = volume(v)
1 (Let us consider a reaction;
-	According to law of mass action; Rate of forward reaction & [A][B]
	Where, ky is the velocity constant for forward reaction.
	Rate of backward reaction & [C][D]
	hlhere, Kin is the velocity constant for backward reaction
11	At. Equilibrium; Rate of forward reaction = Rate of backward reaction
	or, K_f [A][B] = K_b [C][D] K_f [C][D]
9 18	OY, -K, = [A][B] EU][D]
1	here Kis a constant known as equilibrium Cons-

tant 2 97 is defined as the ratio of velocity constant for forward reaction to velocity Governt for backward reaction

			••
			Page : Date : / /
	OR,	d.: 3	0 2 - 17
	It can be defined:	as the ratio of	product of
	It can be defined a	k to that if it	reactants.
	School Williams		
	For a general reaction	on the state of	7 1 4
	2A+6B=	€ cC + dD	
	Then.		+ 7 10
1	K = [c]°. [x	d	(8)
	[A] ? [G	16 CO	Tilly I'm
	1:01	16 715	<u> </u>
#	Characteristics of eq	uilibryum constan	ntest
95	Lancert cases west	Object of the Party	在"加工"等
<u>"</u>)	It is a Gonstant for	particular reaction	on at a particu-
	las removerature.	गाउँ । विशेषिक । वात	210 124
(1) (1) (2)	It doesn't depend upo	in the Concentra	from of red changs.
111)	It doesn't depends up	on we of cata	lyst
iv)	It depends upon		7 1/1-
	43, 400 3.	n hashing more	
#	For Examples:	The state of the s	
ij	A1 ->>	real var	- FX
2	N2 + 3H2	2NH3 then,	[NH3]2
3.4	(多) (多)	(b) Kc=	[N2]·[H2]3
.0.	124 January R. P. J.	2 March 183 183	Triply and
(1)	Caco ₂ (ao		and the part
	(5)	(2) & Then, Ical	OT [CONT LATION]

P

[caco2] ,

11

Kc =

n.

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	Date: / /
ů	$2NO + 6H_2O = 4NH_3 + 5O_2$
	(5) (1)
	Then, it is a long to the same of the same
	[NH ₃] ⁴ . [0 ₂] ⁵ [NH ₃] ⁴ [0 ₂] ⁵
-	$\frac{[NH_{3}]^{4}[O_{2}]^{5}}{k_{c} = [NO]^{2} [H_{2}O]^{c}} = \frac{[NH_{3}]^{4}[O_{2}]^{5}}{[NO]^{2}} = \frac{1}{2}$
	The state of the s
ĨV.	
	(5) (8)
	Then [co]2 [co]2
	Kc = [c] [coz] = [coz]
	3. 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
*	Equilibrium Constant in terms of partial pressure:
	Ele with the color of the color
(Con)	For gaseous reaction molar concentration is directly pro-
	portional to partial pressure so equilibrium constant con
	be expressed in terms of partial pressure.
	From Ideal gas equation;
	pvenkt
7	Allena D. Salla Carrette and Ca
	Where Pa is the partial pressure of gas A, Vis total volume of reaction mixture. On is no of moles of gas A; Ris
	of reaction mixture. This no. of moles of gas A; Ris
or,	iniversal gas Constant & Tis temperature.
	PA = MA - RT
11	PA = CARTO
- J.,	PA = [A] RT
	At Constant temperatuse; A & [A]

,	Page:	
TOP	Ome: / /	
	Relation between Kpk Ke	
	Le us consider general gaseous reaction;	
3 37	Let us consider general gaseous reaction: 7A+bB=>cC+dD	
	The second of th	
	The equilibrium Constant in terms of Concentration is written	
	$\frac{CcJ' \left[2J^{4} \right]}{kc = \left[AJ^{2} \left[BJ^{6} \right] \right]}$	
	Ke = [A] 2 [B]b	
-	& Comment of the comm	
	Equilibrium Constant in termy of partial pressure is written as;	
	$K_{p} = P_{A}^{2} \times P_{B}^{2}$	
	Kp = Pa v PB	
in Strain	the state of the same of the Contract of the same of	
F. C -	Where, Pa, Po, Po & B are partial pressure of gas A.B. (40	
12.00	TESPECHIVELY.	
12.6 3-	Now, from ideal gas equation:	
and the	pvener	
or,	Pav-nart	
01	PA = MA RT	
01,	PA = [A]RT Similarly; Po = [B]RT & Pc=[C]RT & PD=[D]RT	
	Putting Value of PA. PB, Pc & Po in ear(i)	
	[C] (RT)C. [D]d. (RT)d [C] C[D]d (RT) Ctd	
7	KP = [A] (RT) 2. [B] . (RT) b [A] 1 [B] b (RT) A+6	
- 5	Kp = Kc · (RT) (ctd)-(atb)	
)	Kp=Kc(RT)An Where,	
	In=(+d)-(a+b) OR,	
	[An = Change in no of moles of products & reactant]	

		Page:
		Date: / /
	Characteristics of Equilibrium:	. Strain
-	the state of the s	1 1 1 1 1 1 1 1
7	At Cquilibrium constant of reactant & product	remain Constant
- 5	Caulibrium is dynamic in nature.	
9	tquilibrium maintain only in a closed vessel.	1
7	At equilibrium there is no effect of Catalyst.	
3)	It can be maintained from either direction.	
	The equilibrium is characterised by a consta	nt Which is
	Known at equilibrium Constant.	and and
11-	N	
12	Dynamic nature of equilibrium:	
	The reversible reaction the rate of form	and reaction is
	high at the beginning. As the reaction proceed	us, the Concentra
,	on of reactant decreases and rate of fore	vasd reaction
7	2150. On other hand the Concentration of	product incredien
	is the rate of backward reaction also find	eases offlains
	a limiting value as shown in figure:	
	me lime .	5 1 10
	of Boguitibriu D	A 1,73
	TK C	Fate as
	C. S. Time	6 01/1
Fir	vally a state come of valed care of 1	. 10
legui	ally, a State Come at which rate of forward r	eaction becomes
1 ch	are in the concentration of machine to equal tates -	there is no net
Sto	angle in the concentration of reactant & product but p. So, the equilibrium is dynamic in mature	reaction doesn't
	15 ayriamic in matur	<u>l</u>

Types of equilibrium: (1) Homogenous equilibrium: Is the equilibrium in which all the reactants de products was present in the same phase is known as homogenous equilibrium. N2 + 3H2 - 2NH3 (3) (8) (8) (ii) Heterogenous equilibrium: In the equilibrium in which the reactants & products Leterogenous equilibrium.

(a(0) = (a0 + co) (3) # Le-chartelier's principle:
4 It states," If a System in equilibrium is Subjected
to Change in Concentration, temperature or pressure,
then equilibrium shifts in the direction so as to
neutralize the affect of Change: () Effect of Concentration: on increasing concentration, equilibrium shifts in the direction where increased concentration is Consumed . i.e., on increasing Concentration of reactants equilibrium shifts in forward direction Similarly, On increasing Concentration of pooducts

	Page:
	Date: / /
	equilibrium Shifts in backward direction.
,	
	Effect of temperature: On increasing temperature, equilibrium Shifts in the direction of temperature increased temperature
7	on increasing temperatule, pavilibrium Shifts in
	15 absorbed. Thus endothermic reaction shifts
	in forward direction on increasing temperature
	Similarly, exothermic reactions shifts in backward
	direction on increasing temperature.
~	
(11)	Effect of pressure:
-5	On increasing pressure the equilibrium shifts in
-	the direction where volume or no of moles
	decrease. P.e., Equilibrium Shifts in direction
	Where Less no. of moles or molecules are
	present.
11	To Smith was in the last to the time to the
-11	Applications of Le-chatelier's principle in Chemical equilibrium
0	no mit side with the collaboration of the man ingli-
(D)	Formation of Ammonia from Hydrogen & Nitrogen:
	N2 7 3H2 = 2NH3 + Heat
	2 mole 3 mole 2 mole
	N2 7 3H2 = 2NH3, H= -92.5 Ky/mol
> 11	Larine on bottometi myre undharing the
7) 1	ffect of Concentration:
17	On increasing concentration of hydrogen & Nitrogen,
>	quilibrium Shifts in the forward direction.
11	

	<u></u>	the first femore & sales in the said to the said
		Page:
		Date: / /
_	16)	Effect of temperature:
_	17	On increasing temperature of the KN2, equilibrium shifts
_	- 70.	in backward direction.
_	1 10	(in a major to later the state of the field
_	(1)	Effect of pressure:
_		On increasing pressure of H2 & N2 equilibrium Shifts in
<u></u>	47	forward direction.
_	377.	The thing of his Indian State of Edge think
_	(11)	formation of Nitric exide:
_	,	No + 02 ==== 2 ND AH = +180 Karlmol
	10 1	(5) (5)
_	22 44	The middle the man was a standard to the standard of the stand
<u>.</u>	(11)	Formation of Sulbhuz trioxide:
	1 1 1 1	2502 + 02 = 2503 + Heat
	The co	and the contract of the second second
	7	Application of Le-chatelier's principle in physical equilibrium:
m'c	(1)	Ice-Water equilibrium:
		Ice = > Walter - Heat
		(s) of the control of
	(6)	Water-Water Vapour equilibrium:
		Water > water yapour - heat
		1 Sit a le find a contra service significant of the life.
	(0)	Caray-gas in Solution:
		gas = gas in Solution
	417	Course i and horacon the attention in
	1-1-1	in a programme of the second second second second