Equilibria Knowledge organiser

1. Keywords

Equilibrium	When a reversible reaction has the same rate in both directions and the concentrations do not change. Happens in a closed system
Le Charteliers principle	If a change is made to a system at equilibrium then the equilibrium will shift to oppose that change

3. Kc

$$aA + bB \rightleftharpoons cC + dD$$

$$K_c = \frac{[C]^c[D]^d}{[A]^a[B]^b}$$

[ ]	Concentration / mol dm^{-3}
Kc >1	In favour of products
Kc<1	In favour of reactants

4. Molar ratios

$$A + B \rightleftharpoons C$$

	A	B	C
Moles at start	2.0	3.0	0.0
Change	-0.8		
Moles at equilibrium			

2. Le Charteliers principle

Factor	Effect on equilibrium	Reason	Example
Pressure Increase	Shifts to side with least moles	To decrease the pressure to reach the equilibrium pressure again	It will shift to the right as it has the least moles
Pressure Decrease	Shifts to side with most moles	To increase the pressure	It will shift to the left as it has the most moles
Concentration Increase	Shifts to other side	To decrease the concentration of what was increased	If the concentration of A is increased it will shift to the right
Concentration Decrease	Shifts to the same side	To increase the concentration of what was decreased	If the concentration of A is decreased it will shift to the left
Temperature Increase	Shifts in the endothermic direction	To cool down the reaction	It will shift to the left as this is the endothermic direction
Temperature Decrease	Shifts in the exothermic direction	To heat up the reaction	It will shift to the right as it is the exothermic direction

5. Units of Kc

$$2A + B \rightleftharpoons C$$

$$\frac{moldm^{-3}}{(moldm^{-3})^2(moldm^{-3})}$$

$$\frac{moldm^{-3}}{(moldm^{-3})^2(moldm^{-3})} = \frac{1}{(moldm^{-3})^2}$$

$$= mol^{-2}dm^6$$