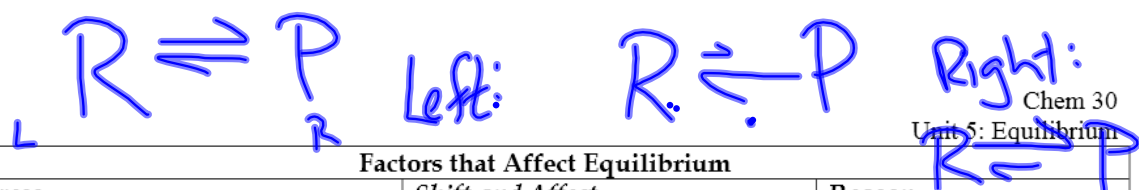


5.5 Answers



Factors that Affect Equilibrium		
Stress	Shift and Affect	Reason
Concentration		
$\uparrow [\text{reactant}]$	$R \rightleftharpoons P \uparrow [\text{prod}]$	use excess reactant to $\uparrow [\text{prod}]$
$\uparrow [\text{product}]$	$R \rightleftharpoons P \uparrow [\text{react}]$	excess prod to $\uparrow [\text{react}]$
$\downarrow [\text{reactant}]$	$R \rightleftharpoons P \uparrow [\text{react}]$	excess prod. to $\uparrow [\text{react}]$
$\downarrow [\text{product}]$	$R \rightleftharpoons P \uparrow [\text{prod}]$	excess react to $\uparrow [\text{prod}]$
Temperature		
$\uparrow T^\circ$ on endothermic reaction $R + \text{NRG} \rightleftharpoons P$	$R \rightleftharpoons P \uparrow [\text{prod}]$	excess NRG to use.
$\uparrow T^\circ$ on exothermic reaction $R \rightleftharpoons \text{NRG} + P$	$R \rightleftharpoons P \uparrow [\text{react}]$	excess NRG (in reverse) produce more NRG.
$\downarrow T^\circ$ on endothermic reaction $R + \text{NRG} \rightleftharpoons P$	$R \rightleftharpoons P \uparrow [\text{react}]$	produce more energy.
$\downarrow T^\circ$ on exothermic reaction $R \rightleftharpoons \text{NRG} + P$	$R \rightleftharpoons P \uparrow [\text{prod}]$	produce more energy.
Pressure/Volume *ignore for solids and liquids ** only has affect if unequal # moles on reactant and product sides		
$\uparrow P (\downarrow V)$ more # moles on reactant side $2R \rightleftharpoons 1P$	$R \rightleftharpoons P \uparrow [\text{prod}]$	$\downarrow \# \text{ moles.}$
$\uparrow P (\downarrow V)$ more # moles on product side $1R \rightleftharpoons 2P$	$R \rightleftharpoons P \uparrow [\text{react}]$	$\downarrow \# \text{ moles.}$
$\downarrow P (\uparrow V)$ more # moles on reactant side $2R \rightleftharpoons 1P$	$R \rightleftharpoons P \uparrow [\text{react}]$	$\uparrow \# \text{ moles.}$
$\downarrow P (\uparrow V)$ more # moles on product side $1R \rightleftharpoons 2P$	$R \rightleftharpoons P \uparrow [\text{prod}]$	$\uparrow \# \text{ moles.}$