

	RATE	EQUILIBRIUM	
	Explain	Explain	State/ Predict/ According to Le Chatelier
		Using as eg: $\text{N}_{2(g)} + 3\text{H}_{2(g)} \rightleftharpoons 2\text{NH}_{3(g)} \quad \Delta H = -92 \text{ kJ}$	Using as eg: $\text{N}_{2(g)} + 3\text{H}_{2(g)} \rightleftharpoons 2\text{NH}_{3(g)} \quad \Delta H = -92 \text{ kJ}$
<b>Temperature</b>	<p>Increasing the temperature increases the average kinetic energy of the particles. This increases the proportion of particles that have sufficient kinetic energy to meet the activation energy so reaction rate increases.</p> <p>To a lesser degree, increasing the kinetic energy of the reactant particles increases the speed of the particles. This increases the frequency of collisions which increases the reaction rate.</p> <p>Decreasing the temperature decreases the average kinetic energy of the particles. This decreases the proportion of particles that have sufficient kinetic energy to meet the activation energy so reaction rate decreases.</p> <p>To a much lesser degree, decreasing the kinetic energy of the particles decreases the speed of the particles. This decreases the frequency of collisions which decreases the reaction rate.</p>	<p><i>Increasing</i> the temperature <i>increases</i> the rate of both the forward and reverse reactions but it <i>increases</i> the rate of the endothermic reverse reaction more.</p> <p>This increases the rate of the <i>reverse</i> reaction relative to the <i>forward</i> reaction and so the equilibrium shifts <i>left</i> until a new equilibrium is established.</p> <p><i>Decreasing</i> the temperature <i>decreases</i> the rate of both the forward and reverse reactions but it <i>decreases</i> the rate of the endothermic reverse reaction more.</p> <p>This decreases the rate of the <i>reverse</i> reaction relative to the <i>forward</i> reaction and so the equilibrium shifts <i>right</i> until a new equilibrium is established.</p>	<p>According to Le Chatelier the system will react to partially counteract the imposed change. As such, increasing the temperature will favour the <i>reverse</i> endothermic reaction which decreases the temperature, and the equilibrium shifts <i>left</i> until a new equilibrium is established.</p> <p>According to Le Chatelier the system will react to partially counteract the imposed change. As such, decreasing the temperature will favour the <i>forward exothermic</i> reaction which increases the temperature, and the equilibrium shifts <i>right</i> until a new equilibrium is established.</p>
<b>Pressure/ Volume</b>	<p>Increasing the pressure of a gas (by either reducing the volume or adding more of the same gas) decreases the distance between the particles. This increases the frequency of collisions which increases the reaction rate.</p> <p>Decreasing the pressure of a gas (by either increasing the volume or removing more of the same gas) increases the distance between the particles. This decreases the frequency of collisions which decreases the reaction rate.</p>	<p><i>Increasing</i> the volume of the system <b>OR</b> <i>decreasing</i> the pressure of the system, will <i>increase</i> the distance between all the particles.</p> <p>This <i>decreases</i> the frequency of collisions which <i>decreases</i> the rate of both the forward and reverse reactions.</p> <p>The rate of the forward reaction, that uses up the most particles, will <i>decrease</i> more. This decreases the rate of the <i>forward</i> reaction relative to the <i>reverse</i> reaction and so the equilibrium shifts <i>left</i> until a new equilibrium is established.</p> <p><i>Decreasing</i> the volume of the system <b>OR</b> <i>increasing</i> the pressure of the system, will <i>decrease</i> the distance between all the particles.</p> <p>This <i>increases</i> the frequency of collisions which <i>increases</i> the rate of both the forward and reverse reactions.</p> <p>The rate of the forward reaction, that uses up the most particles, will <i>increase</i> more.</p> <p>This increases the rate of the <i>forward</i> reaction relative to the <i>reverse</i> reaction and so the equilibrium shifts <i>right</i> until a new equilibrium is established.</p>	<p>According to Le Chatelier the system will react to partially counteract the imposed change. As such, decreasing the pressure will favour the <i>reverse</i> reaction which increases the pressure as it produces more particles, and the equilibrium shifts left until a new equilibrium is established.</p> <p>According to Le Chatelier the system will react to partially counteract the imposed change. As such, increasing the pressure will favour the <i>forward</i> reaction which decreases the pressure as it produces fewer particles, and the equilibrium shifts right until a new equilibrium is established.</p>
<b>Concentration/ Partial Pressure</b>	<p>Increasing the concentration of one or more of the reactants, decreases the distance between particles. This increases the frequency of collisions which increases the reaction rate.</p> <p>Decreasing the concentration of one or more of the reactants, increases the distance between particles. This decreases the frequency of collisions which decreases the reaction rate.</p>	<p>Increasing the concentration of hydrogen (by adding more hydrogen to the system) decreases the distance between the reactant particles. This increases the frequency of collisions which increases the rate of the forward reaction relative to the reverse reaction and the equilibrium shifts right until a new equilibrium is established.</p> <p>Decreasing the concentration of hydrogen (by removing hydrogen from the system) increases the distance between the hydrogen particles. This decreases the frequency of collisions which decreases the rate of the forward reaction relative to the reverse reaction and the equilibrium shifts left until a new equilibrium is established.</p>	<p>According to Le Chatelier the system will react to partially counteract the imposed change. As such, increasing the concentration of hydrogen will favour the <i>forward</i> reaction which decreases the concentration of hydrogen as it uses it up, and the equilibrium shifts right until a new equilibrium is established.</p> <p>According to Le Chatelier the system will react to partially counteract the imposed change. As such, decreasing the concentration of hydrogen will favour the <i>reverse</i> reaction which increases the concentration of hydrogen as it produces more and the equilibrium shifts left until a new equilibrium is established.</p>