

Name:

Period:

Seat#:

<p>1) Which change would cause the equilibrium to shift to the right in this endothermic rxn? <i>Circle an answer choice!</i> $\text{CH}_4(\text{g}) + 2\text{H}_2\text{S}(\text{g}) \leftrightarrow \text{CS}_2(\text{g}) + 4\text{H}_2(\text{g})$</p> <p>a. Decrease the concentration of dihydrogen sulfide.</p> <p>b. Increase the pressure on the system.</p> <p>c. Increase the temperature of the system.</p> <p>d. Increase the concentration of carbon disulfide.</p>	<p>2) What happens to equilibrium position in each situation $2\text{SO}_3(\text{g}) \leftrightarrow 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$</p> <ul style="list-style-type: none"> Sulfur dioxide is added to the system. Sulfur trioxide is removed from the system. Oxygen is added to the system.
<p>3) What would happen to the position of the equilibrium $2\text{HgO}(\text{s}) \leftrightarrow \text{Hg}(\text{l}) + \text{O}_2(\text{g})$</p> <ul style="list-style-type: none"> HgO is added to the system. The pressure on the system increases. 	<p>4) When the volume of the following mixture of gases is increased, what will be the effect on equilibrium position? $4\text{HCl}(\text{g}) + \text{O}_2(\text{g}) \leftrightarrow 2\text{H}_2\text{O}(\text{g}) + 2\text{Cl}_2(\text{g})$</p>
<p>5) Predict the effect of decreasing the volume of the container for each equilibrium.</p> <ul style="list-style-type: none"> $2\text{H}_2\text{O}(\text{g}) + \text{N}_2(\text{g}) \leftrightarrow 2\text{H}_2(\text{g}) + 2\text{NO}(\text{g})$ $\text{SiO}_2(\text{s}) + 4\text{HF}(\text{g}) \leftrightarrow \text{SiF}_4(\text{g}) + 2\text{H}_2\text{O}(\text{g})$ $\text{CO}(\text{g}) + \text{H}_2(\text{g}) \leftrightarrow \text{C}(\text{s}) + \text{H}_2\text{O}(\text{g})$ 	<p>6) Predict the effect of decreasing the temperature on the position of the following equilibria.</p> <ul style="list-style-type: none"> $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \leftrightarrow 2\text{HCl}(\text{g}) + 49.7 \text{ kJ}$ $2\text{NH}_3(\text{g}) \leftrightarrow \text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \quad \Delta H = +37.2 \text{ kJ}$ $\text{CO}(\text{g}) + \text{H}_2\text{O}(\text{g}) \leftrightarrow \text{CO}_2(\text{g}) + \text{H}_2(\text{g}) \quad \Delta H = -27.6 \text{ kJ}$
<p>7) In the following reaction, will the $[\text{H}_2]$ increase or decrease when equilibrium is reestablished after these stresses are applied? $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \leftrightarrow 2\text{NH}_3(\text{g}) + 22 \text{ kJ}$</p> <ul style="list-style-type: none"> $\text{NH}_3(\text{g})$ is added $\text{N}_2(\text{g})$ is removed Pressure is increased Temperature is increased 	<p>8) How would an increase in pressure affect the $[\text{H}_2]$ in the following reactions?</p> <ul style="list-style-type: none"> $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \leftrightarrow 2\text{H}_2\text{O}(\text{g})$ $4\text{H}_2(\text{g}) + \text{Fe}_3\text{O}_4(\text{s}) \leftrightarrow 3\text{Fe}(\text{s}) + 4\text{H}_2\text{O}(\text{l})$ $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \leftrightarrow 2\text{HCl}(\text{g})$ <p>9) State Le Chatelier's Principle in your own words.</p>

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Equilibrium – Le Chatelier’s Principle Practice #2

<p>10) In which direction, left or right, will the equilibrium shift if the following changes are made? $2 \text{NO} (g) + \text{H}_2(g) \leftrightarrow \text{N}_2\text{O} (g) + \text{H}_2\text{O} (g) + 36 \text{ kJ}$</p> <ul style="list-style-type: none">• NO is added• The system is cooled• H₂ is removed• Pressure is increased• N₂O is added• H₂ is added	<p>11) In the reaction: $\text{CO}_2(g) + \text{H}_2(g) + \text{heat} \leftrightarrow \text{CO}(g) + \text{H}_2\text{O}(g)$</p> <ul style="list-style-type: none">• Is heat absorbed or released by the forward reaction?• In which direction will the equilibrium shift if these changes are made?• CO is added• Temperature is increased• CO₂ is added• System is cooled• H₂ is removed• Pressure is increased• Catalyst is added
<p>12) $2\text{NO}(g) + \text{H}_2(g) \leftrightarrow \text{N}_2\text{O}(g) + \text{H}_2\text{O}(g) + \text{heat}$ What will happen to the [H₂O] when equilibrium is reestablished after these stresses are applied?</p> <ul style="list-style-type: none">• Temperature is increased• A catalyst is added• Pressure is decreased• NO is added• N₂O is removed	<p>13) The reaction of iron(III) oxide with carbon monoxide occurs in a blast furnace when iron ore is reduced to iron metal: $\text{Fe}_2\text{O}_3 (s) + 3\text{CO} (g) \leftrightarrow 2\text{Fe} (l) + 3\text{CO}_2 (g)$ Use Le Chatelier’s Principle to predict the direction of reaction when an equilibrium mixture is disturbed by:</p> <ul style="list-style-type: none">• Adding CO (g)• Removing CO₂ (g)• Removing Fe (l)• Decrease the volume
<p>14) For the reaction, $\text{PCl}_5(g) \leftrightarrow \text{PCl}_3(g) + \text{Cl}_2(g)$ $\Delta H_{\text{rxn}} = 111 \text{ kJ}$ Which way does the reaction shift when you:</p> <ul style="list-style-type: none">• Remove Cl₂• Add Ne• Decrease volume• Increase pressure• Increase temperature• Add a catalyst	<p>15) For the reaction: $2\text{HI}(g) \leftrightarrow \text{H}_2(g) + \text{I}_2(g)$ $\Delta H_{\text{rxn}} = -51.8 \text{ kJ}$ Which way does the reaction shift when you:</p> <ul style="list-style-type: none">• Add H₂• Remove HI• Add Kr• Increase volume• Decrease pressure• Decrease temperature

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