

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> CH₄ (g) + 2H₂S (g) ↔ CS₂ (g) + 4H₂ (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 2SO₃ (g) ↔ 2SO₂ (g) + O₂ (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 2HgO (s) ↔ Hg (l) + O₂ (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? 4HCl (g) + O₂ (g) ↔ 2H₂O (g) + 2Cl₂ (g)</p>
<p>5) Predict the effect of decreasing the volume of the container for each equilibrium.</p> <ul style="list-style-type: none"> • 2H₂O (g) + N₂ (g) ↔ 2H₂ (g) + 2NO (g) • SiO₂ (s) + 4HF (g) ↔ SiF₄ (g) + 2H₂O (g) • CO (g) + H₂ (g) ↔ C (s) + H₂O (g) 	<p>6) Predict the effect of decreasing the temperature on the position of the following equilibria.</p> <ul style="list-style-type: none"> • H₂ (g) + Cl₂ (g) ↔ 2HCl (g) + 49.7 kJ • 2NH₃ (g) ↔ N₂ (g) + 3H₂ (g) ΔH = +37.2 kJ • CO (g) + H₂O (g) ↔ CO₂ (g) + H₂ (g) ΔH = -27.6 kJ
<p>7) In the following reaction, will the [H₂] increase or decrease when equilibrium is reestablished after these stresses are applied? N₂ (g) + 3 H₂ (g) ↔ 2 NH₃ (g) + 22 kJ</p> <ul style="list-style-type: none"> • NH₃ (g) is added • N₂ (g) is removed • Pressure is increased • Temperature is increased 	<p>8) How would an increase in pressure affect the [H₂] in the following reactions?</p> <ul style="list-style-type: none"> • 2 H₂ (g) + O₂ (g) ↔ 2 H₂O (g) • 4 H₂ (g) + Fe₃O₄ (s) ↔ 3 Fe (s) + 4 H₂O (l) • H₂ (g) + Cl₂ (g) ↔ 2 HCl (g)
	<p>9) State Le Chatelier’s Principle in your own words.</p>

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<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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