

Name: \_\_\_\_\_

Period: \_\_\_\_\_

Seat#: \_\_\_\_\_

#1	$\text{N}_2\text{O}_4(g) \rightleftharpoons 2\text{NO}_2(g) \quad \Delta H = + 92 \text{ KJ}$				
The Stress	Shift Right or Left	$\Delta [\text{N}_2\text{O}_4]$	$\Delta [\text{NO}_2]$	$\Delta$ Temperature	
[N <sub>2</sub> O <sub>4</sub> ] is increased					
[NO <sub>2</sub> ] is increased					
Temp is increased					
[N <sub>2</sub> O <sub>4</sub> ] is decreased					
[NO <sub>2</sub> ] is decreased					
Temp is decreased					
#2	$4\text{HCl}(g) + \text{O}_2(g) \rightleftharpoons 2\text{H}_2\text{O}(g) + 2\text{Cl}_2(g) + 98 \text{ KJ}$				
The Stress	Shift Right or Left	$\Delta [\text{HCl}]$	$\Delta [\text{O}_2]$	$\Delta [\text{H}_2\text{O}]$	$\Delta$ Temperature
[HCl] is increased					
[H <sub>2</sub> O] is increased					
[O <sub>2</sub> ] is increased					
Temp is increased					
#3	$\text{CaCO}_3(s) + 170 \text{ KJ} \rightleftharpoons \text{CaO}(s) + \text{CO}_2(g)$ Reminder: Adding or removing solids or liquids does not shift the equilibrium.				
The Stress	Shift Right or Left	$\Delta [\text{CaCO}_3]$	$\Delta$ Temperature	$\Delta [\text{CaO}]$	$\Delta [\text{CO}_2]$
CaCO <sub>3</sub> is added					
CaO is added					
CO <sub>2</sub> is added					
Temp is decreased					
A catalyst is added					
[CO <sub>2</sub> ] is decreased					
Temp is increased					
CaO is removed					

Dougherty Valley HS Chemistry  
Equilibrium – Le Chatelier’s Principle Practice #1

#4	State the direction in which each of the following equilibrium systems would be shifted upon the application of the following stress. Then state if the concentration of the listed substance will increase or decrease.		
The Stress	Reaction	Shift Right or Left	[ X ] increase or decrease?
decrease temperature	$2 \text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{SO}_3(\text{g}) + \text{energy}$		[SO <sub>3</sub> ]
increase temperature	$\text{C}(\text{s}) + \text{CO}_2(\text{g}) + \text{energy} \rightleftharpoons 2 \text{CO}(\text{g})$		[C]
increase total pressure	$\text{N}_2\text{O}_4(\text{g}) \rightleftharpoons 2 \text{NO}_2(\text{g})$		[N <sub>2</sub> O <sub>4</sub> ]
decrease total pressure	$\text{CO}(\text{g}) + \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{CO}_2(\text{g}) + \text{H}_2(\text{g})$		[H <sub>2</sub> ]
decrease total pressure	$2 \text{NOBr}(\text{g}) \rightleftharpoons 2 \text{NO}(\text{g}) + \text{Br}_2(\text{g})$		[Br <sub>2</sub> ]
add Fe <sub>(s)</sub>	$3 \text{Fe}(\text{s}) + 4 \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{Fe}_3\text{O}_4(\text{s}) + 4 \text{H}_2(\text{g})$		[Fe]
add catalyst	$2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{SO}_3(\text{g})$		[O <sub>2</sub> ]
remove CO <sub>2(g)</sub>	$\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$		[CO <sub>2</sub> ]
increase [H <sub>2(g)</sub> ]	$\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g})$		[H <sub>2</sub> ]

#5	Consider the following equilibrium system: $3 \text{H}_2(\text{g}) + \text{N}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g}) + \text{Heat}$ .				
The Stress	Shift Right or Left	Δ [H <sub>2</sub> ]	Δ[N <sub>2</sub> ]	Δ [NH <sub>3</sub> ]	Δ Heat
More N <sub>2</sub> is added to the system					
Some NH <sub>3</sub> is removed from the system					
The temperature is increased					
The volume of the vessel is increased					
A catalyst was added					

#6	Consider the following equilibrium system: $3 \text{Fe}(\text{s}) + 4 \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{Fe}_3\text{O}_4(\text{s}) + 4 \text{H}_2(\text{g})$				
The Stress	Shift Right or Left	Δ [Fe]	Δ [H <sub>2</sub> O]	Δ [Fe <sub>3</sub> O <sub>4</sub> ]	Δ [H <sub>2</sub> ]
The volume of the vessel is decreased					
The pressure is decreased					
More Fe is added to the system					
Some Fe <sub>3</sub> O <sub>4</sub> is removed from the system					
A catalyst is added to the system					