

#4	State the direction in which each of the following equilibrium systems would be shifted upon the application of the following stress listed beside the equation.				
The Stress	Reaction	Right or Left	[ ] 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>	$3 \text{Fe}(\text{s}) + 4 \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{Fe}_3\text{O}_4(\text{s}) + 4 \text{H}_2(\text{g})$		[H <sub>2</sub> ]		
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</sub> (g)	$\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$		[CaO]		
increase [H <sub>2</sub> (g)]	$\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g})$		[N <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	Right or Left	[H <sub>2</sub> ]	[N <sub>2</sub> ]	[NH <sub>3</sub> ]	
More N <sub>2</sub> is added to the system			skip		
Some NH <sub>3</sub> is removed from the system				skip	
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	Right or Left	[Fe]	[H <sub>2</sub> O]	[Fe <sub>3</sub> O <sub>4</sub> ]	[H <sub>2</sub> ]
The volume of the vessel is decreased					
The pressure is decreased					
More Fe is added to the system		skip			
Some Fe <sub>3</sub> O <sub>4</sub> is removed from the system				skip	
A catalyst is added to the system					