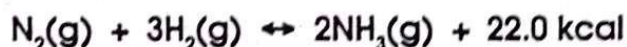


# LE CHATELIER'S PRINCIPLE

Name \_\_\_\_\_

Le Chatelier's Principle states that when a system at equilibrium is subjected to a stress, the system will shift its equilibrium point in order to relieve the stress.

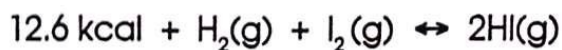
Complete the following chart by writing left, right or none for equilibrium shift, and decreases, increases or remains the same for the concentrations of reactants and products, and for the value of K.



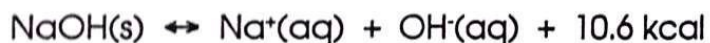
Stress	Equilibrium Shift	$[\text{N}_2]$	$[\text{H}_2]$	$[\text{NH}_3]$	K
1. Add $\text{N}_2$	right	_____	decreases	increases	remains the same
2. Add $\text{H}_2$			_____		
3. Add $\text{NH}_3$				_____	
4. Remove $\text{N}_2$		_____			
5. Remove $\text{H}_2$			_____		
6. Remove $\text{NH}_3$				_____	
7. Increase Temperature					
8. Decrease Temperature					
9. Increase Pressure					
10. Decrease Pressure					

# LE CHATELIER'S PRINCIPLE CONTINUED

Name \_\_\_\_\_



Stress	Equilibrium Shift	[H <sub>2</sub> ]	[I <sub>2</sub> ]	[HI]	K
1. Add H <sub>2</sub>	right	_____	decreases	increases	remains the same
2. Add I <sub>2</sub>			_____		
3. Add HI				_____	
4. Remove H <sub>2</sub>		_____			
5. Remove I <sub>2</sub>			_____		
6. Remove HI				_____	
7. Increase Temperature					
8. Decrease Temperature					
9. Increase Pressure					
10. Decrease Pressure					



(Remember that pure solids and liquids do not affect equilibrium values.)

Stress	Equilibrium Shift	Amount NaOH(s)	[Na <sup>+</sup> ]	[OH <sup>-</sup> ]	K
1. Add NaOH(s)		_____			
2. Add NaCl (Adds Na <sup>+</sup> )			_____		
3. Add KOH (Adds OH <sup>-</sup> )				_____	
4. Add H <sup>+</sup> (Removes OH <sup>-</sup> )				_____	
5. Increase Temperature					
6. Decrease Temperature					
7. Increase Pressure					
8. Decrease Pressure					



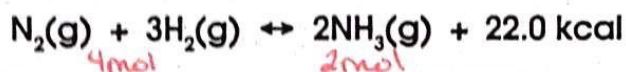
# LE CHATELIER'S PRINCIPLE

Name

*Key*

Le Chatelier's Principle states that when a system at equilibrium is subjected to a stress, the system will shift its equilibrium point in order to relieve the stress.

Complete the following chart by writing left, right or none for equilibrium shift, and decreases, increases or remains the same for the concentrations of reactants and products, and for the value of K.



*exothermic*

Stress	Equilibrium Shift	[N <sub>2</sub> ]	[H <sub>2</sub> ]	[NH <sub>3</sub> ]	K
1. Add N <sub>2</sub>	right	—	decreases	increases	remains the same
2. Add H <sub>2</sub>	<i>right</i>	<i>decreases</i>	—	<i>increases</i>	<i>Same</i>
3. Add NH <sub>3</sub>	<i>left</i>	<i>increases</i>	<i>increases</i>	—	<i>Same</i>
4. Remove N <sub>2</sub>	<i>left</i>	—	<i>increases</i>	<i>decreases</i>	<i>same</i>
5. Remove H <sub>2</sub>	<i>left</i>	<i>increases</i>	—	<i>decreases</i>	<i>Same</i>
6. Remove NH <sub>3</sub>	<i>right</i>	<i>decreases</i>	<i>decreases</i>	—	<i>Same</i>
7. Increase Temperature	<i>left</i>	<i>inc.</i>	<i>inc.</i>	<i>dec.</i>	<i>dec.</i>
8. Decrease Temperature	<i>right</i>	<i>dec.</i>	<i>dec.</i>	<i>inc.</i>	<i>inc.</i>
9. Increase Pressure	<i>right</i>	<i>dec.</i>	<i>dec.</i>	<i>inc.</i>	<i>Same</i>
10. Decrease Pressure	<i>left</i>	<i>inc.</i>	<i>inc.</i>	<i>dec.</i>	<i>Same</i>

*Front in class*

# LE CHATELIER'S PRINCIPLE CONTINUED

Name \_\_\_\_\_



Stress	Equilibrium Shift	[H <sub>2</sub> ]	[I <sub>2</sub> ]	[HI]	K
1. Add H <sub>2</sub>	right	—	decreases	Increases	remains the same
2. Add I <sub>2</sub>	R	dec.	—	inc.	Same
3. Add HI	L	inc.	inc.	—	Same
4. Remove H <sub>2</sub>	L	—	inc.	dec.	Same
5. Remove I <sub>2</sub>	L	inc.	—	dec.	Same
6. Remove HI	R	dec.	dec.	—	Same
7. Increase Temperature	R	dec.	dec.	inc.	inc.
8. Decrease Temperature	L	inc.	inc.	dec.	dec.
9. Increase Pressure	None	Same	—	—	→
10. Decrease Pressure	None	Same	—	—	→

*more exothermic*  
*more endothermic*



Stress	Equilibrium Shift	Amount NaOH(s)	[Na <sup>+</sup> ]	[OH <sup>-</sup> ]	K
1. Add NaOH(s)	none	—	Same	Same	Same
2. Add NaCl (Adds Na <sup>+</sup> )	left	Inc.	—	dec.	Same
3. Add KOH (Adds OH <sup>-</sup> )	L	inc.	dec.	—	Same
4. Add H <sup>+</sup> (Removes OH <sup>-</sup> )	R	dec.	inc.	—	Same
5. Increase Temperature	L	inc.	dec.	dec.	dec.
6. Decrease Temperature	R	dec.	inc.	inc.	inc.
7. Increase Pressure	none	Same	—	—	→
8. Decrease Pressure	none	Same	—	—	→

*more endo*  
*more exo*