

## Reversible Reaction

## Non-Reversible Reaction

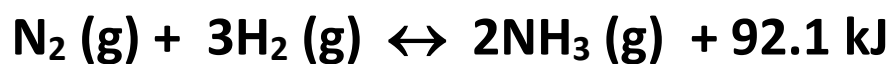
## Le Chatelier's Principle

When a system at equilibrium is subjected to a stress, the system will shift its equilibrium point in order to relieve the stress.

	Equilibrium Reaction	Stress Applied	Shift
1	gas $\leftrightarrow$ heat + liquid	Add more gas	
2	Heat + solid $\leftrightarrow$ liquid	Lower the temperature	
3	Solid + heat $\leftrightarrow$ liquid	Remove heat	
4	Heat + liquid $\leftrightarrow$ gas	Add liquid	
5	gas $\leftrightarrow$ heat + liquid	Add liquid	
6	Liquid $\leftrightarrow$ heat + solid	Raise the temperature	
7.	heat + solid $\leftrightarrow$ liquid	Remove liquid	
8.	Gas $\leftrightarrow$ liquid + heat	Remove gas	

## Le Chatelier's Principle Rules

1. **Increase the Temperature or Heat** causes the reaction to **shift to**
2. **Increase the concentration of reactant or product** causes the reaction to **shift to**
3. **Increase the pressure** causes the reaction with **gases** to **shift to**



	Stress	Equilibrium Shift	[N <sub>2</sub> ]	[H <sub>2</sub> ]	[NH <sub>3</sub> ]
1	Add N <sub>2</sub>		-----		
2	Add NH <sub>3</sub>				-----
3	Remove H <sub>2</sub>			-----	
4	Remove NH <sub>3</sub>				-----
5	Increase temperature				
6	Decrease temperature				
7	Increase Pressure				
8	Decrease Pressure				