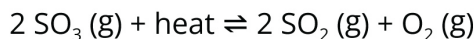


Le Chatelier's Principle

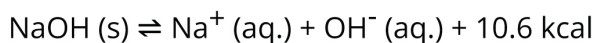
1. For the following reaction, explain how the given stress affects the equilibria.



Stress	Direction of shift	Effect on $[\text{SO}_3]$	Effect on $[\text{SO}_2]$	Effect on $[\text{O}_2]$
Remove SO_2				
Heat the reaction				
Lower pressure				
Cool the reaction				
Increase O_2				

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

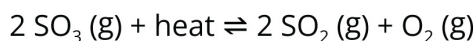
(Remember pure solids and liquids do not affect equilibrium values)



Stress	Equilibrium Shift	Amount of NaOH (s)	$[\text{Na}^+]$	$[\text{OH}^-]$	K
1. Add NaOH (s)					
2. Add NaCl (Adds Na^+)					
3. Add KOH (Adds OH^-)					
4. Add H^+ (Removes OH^-)					
5. Increase Temperature					
6. Decrease Temperature					
7. Increase Pressure					
8. Decrease Pressure					

Le Chatelier's Principle

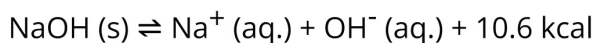
1. For the following reaction, explain how the given stress affects the equilibria.



Stress	Direction of shift	Effect on $[\text{SO}_3]$	Effect on $[\text{SO}_2]$	Effect on $[\text{O}_2]$
Remove SO_2	→	↓	↑	↑
Heat the reaction	→	↓	↑	↑
Lower pressure	→	↓	↑	↑
Cool the reaction	←	↑	↑	↑
Increase O_2	←	↑	↓	↓

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

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



Stress	Equilibrium Shift	Amount of NaOH (s)	$[\text{Na}^+]$	$[\text{OH}^-]$	K
1. Add NaOH (s)	None	—	Same	Same	Same
2. Add NaCl (Adds Na^+)	Left	Increases	—	Decreases	Same
3. Add KOH (Adds OH^-)	Left	Increases	Decreases	—	Same
4. Add H^+ (Removes OH^-)	Right	Decreases	Increases	—	Same
5. Increase Temperature	Left	Increases	Decreases	Decreases	Decreases
6. Decrease Temperature	Right	Decreases	Increases	Increases	Increases
7. Increase Pressure	None	Same	Same	Same	Same
8. Decrease Pressure	None	Same	Same	Same	Same