

# Chemistry 30 IB

## Acids & Bases

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# Unfinished!

## Contents

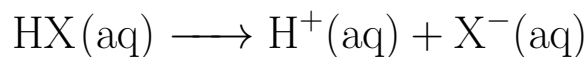
<b>1 Theories</b>	<b>2</b>
1.1 Arrhenius . . . . .	2
1.2 Brønsted-Lowry (aka. Modified Arrhenius) . . . . .	2
<b>2 General Equations</b>	<b>2</b>
2.1 Ionization of Acids . . . . .	2
2.1.1 Strong . . . . .	2
2.1.2 Weak . . . . .	2
2.2 Dissociation of Bases . . . . .	3
2.2.1 Strong . . . . .	3
2.2.2 Weak . . . . .	3
<b>3 pH &amp; pOH</b>	<b>3</b>
3.1 $K_w$ . . . . .	3

# 1 Theories

The following two equations mean the same thing.

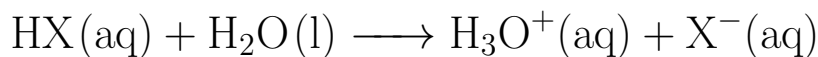
$\text{H}^+(\text{aq})$  and  $\text{H}_3\text{O}^+(\text{aq})$  are interchangeable.

## 1.1 Arrhenius



- doesn't specifically state water is present (aq)
- uses hydrogen ions,  $\text{H}^+(\text{aq})$
- cannot determine strong or weak

## 1.2 Brønsted-Lowry (aka. Modified Arrhenius)



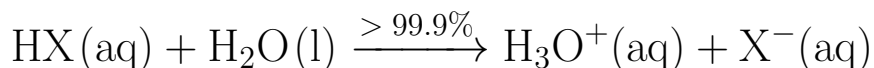
- specifically states water is present
- uses hydronium ions,  $\text{H}_3\text{O}^+(\text{aq})$
- can determine strong or weak

# 2 General Equations

## 2.1 Ionization of Acids

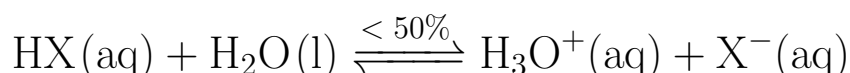
Forming ions from molecular compounds.

### 2.1.1 Strong



- ionize completely ( $> 99.9\%$  of the reaction completes)
- irreversible ( $\longrightarrow$ )
- high  $K$  value ( $K > 1$ )

### 2.1.2 Weak



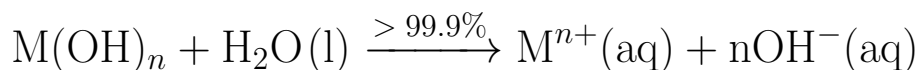
- do not ionize completely ( $< 50\%$  of the reaction completes)
- reversible ( $\rightleftharpoons$ )

- ionize at equilibrium
- low  $K$  value ( $K < 1$ )

## 2.2 Dissociation of Bases

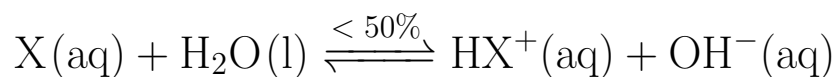
Separation of existing ions in solution.

### 2.2.1 Strong



- M is a metal,  $\text{M}(\text{OH})_n$  is highly soluble
- dissociate quantitatively

### 2.2.2 Weak



- dissociate at equilibrium

## 3 pH & pOH

### 3.1 $K_w$

The equilibrium constant of water can be used to solve for hydrogen ion concentration or hydronium ion concentration when you have the other.

$$K_w = [\text{H}_3\text{O}^{+}][\text{OH}^{-}]$$

$$K_w = 1.00 \times 10^{-14} \text{ mol L}^{-1}$$

$$1.00 \times 10^{-14} \text{ mol L}^{-1} = [\text{H}_3\text{O}^{+}][\text{OH}^{-}]$$