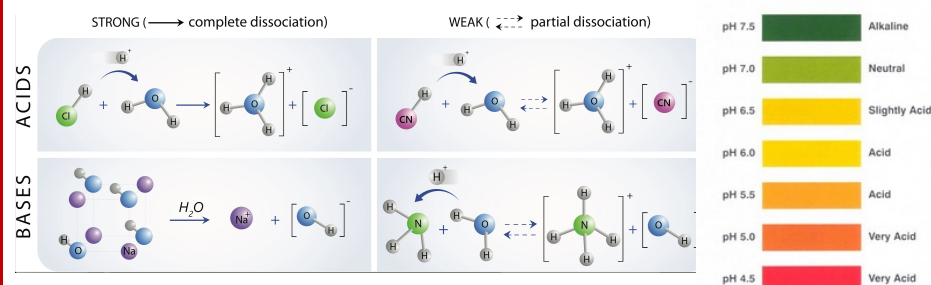
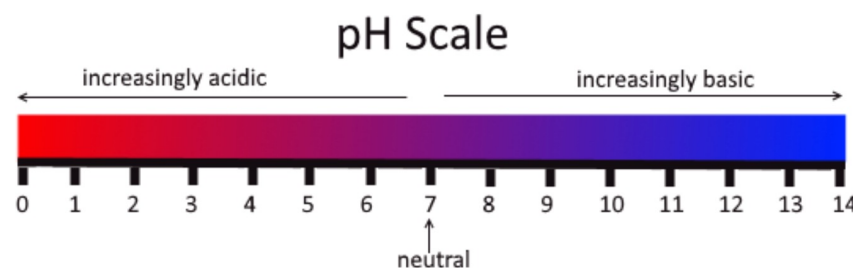


Acids and Bases – Senior Chemistry

- Arrhenius vs Bronsted-Lowry Theory
- Properties of Acids
- Properties of Bases
- Neutralization Reactions
- Conjugate Acid-Base Pairs
- Dissociation of Water
- Common Salts
- Strong vs. Weak Acids and Bases



Preview File

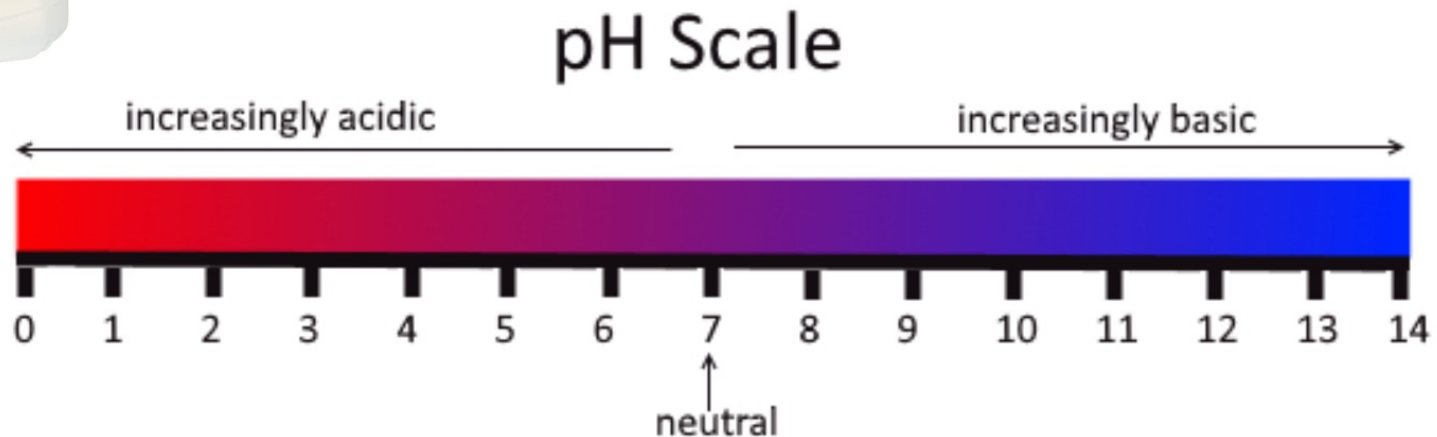
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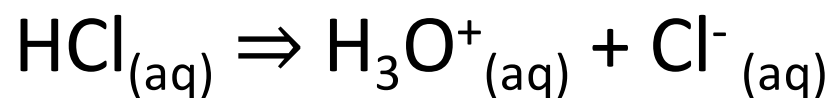
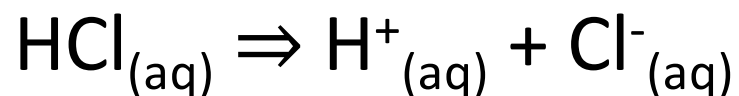
Acids and Bases



There are Two Theories Regarding Acids and Bases

-
- 2) A newer theory was introduced by Bronsted and Lowry in 1924.

Arrhenius Theory - Acids

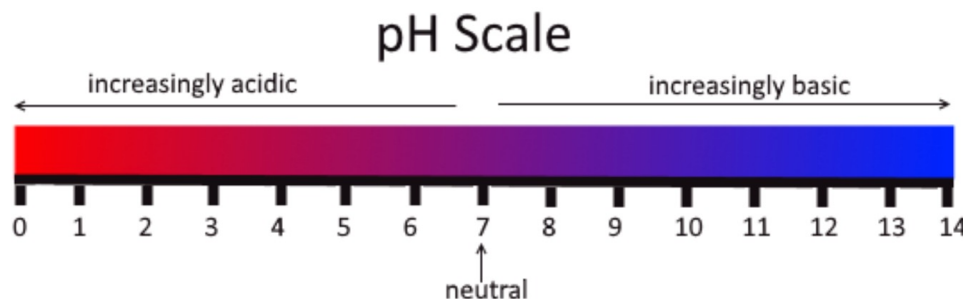


Svante Arrhenius

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Arrhenius Theory - Bases

- _____
- Bases, like acids, are electrolytes and therefore, conduct electricity



Properties of Bases

- _____
- Strong bases like NaOH and KOH , are very corrosive and chemically breakdown organic substances such as fats, hair and vegetable matter
 - For this reason, they are used in drain cleaners



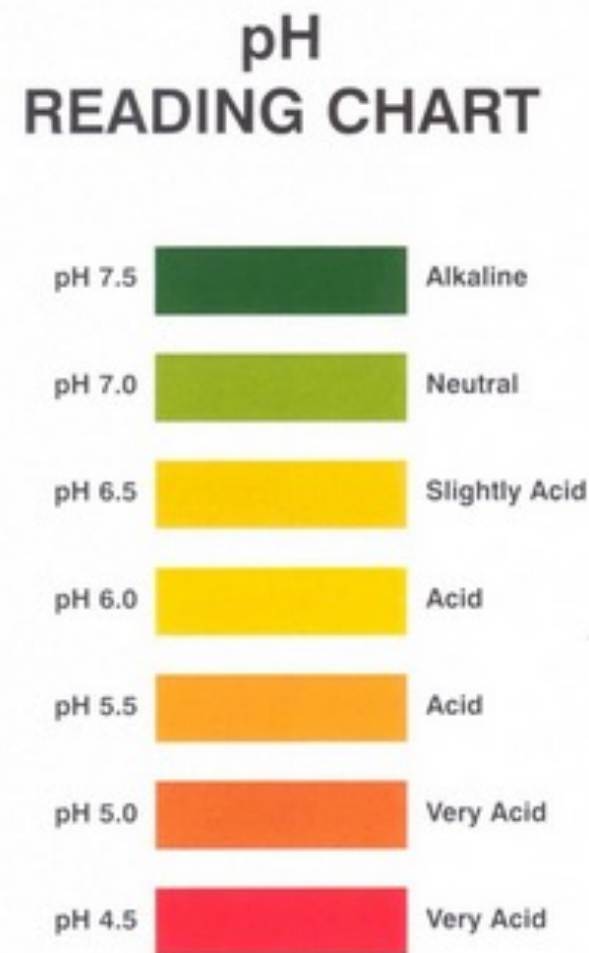
Problems with Arrhenius

- Only substances with H^+ ions could form acids
- Only substances with OH^- ions could form bases
- Means all salts must be neutral, but is not the case
- _____
 - _____

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Indicators

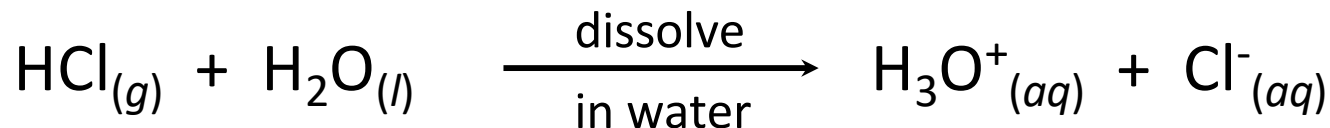
- An indicator is a dye that shows a different color in an acidic solution than it does in a basic solution
- Therefore, indicators are used to show when a solution is acidic or basic



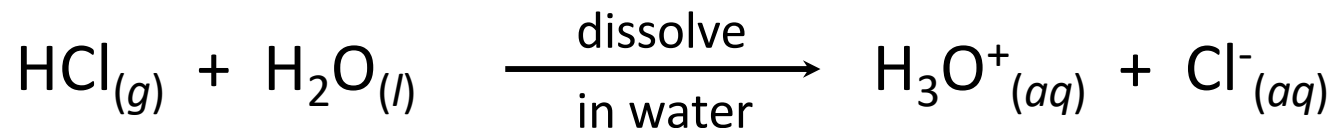
Bronsted-Lowry Theory

In the Bronsted-Lowry model, an acid is any molecule or ion that can give up a hydrogen ion. A base is any molecule or ion that can combine with a hydrogen ion.

- _____
- Any molecule or ion with a hydrogen is a potential acid, and any

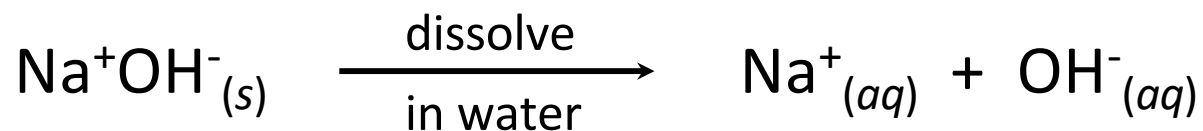


The Hydronium Ion (H_3O^+)

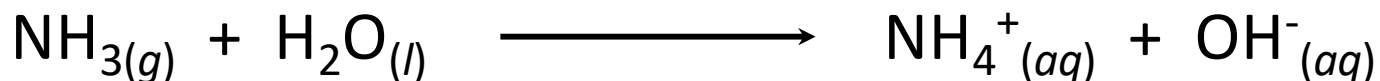


- In this case, water is a proton acceptor, hence it acts as a base
- The equation requires the existence of the hydronium ion
- A free H^+ ion cannot exist in aqueous solution as it is simply a proton, and it was a significant discovery when the hydronium ion was proven to exist
- _____

Bronsted-Lowry Bases



Bronsted Lowry bases accept protons because they possess lone pairs of electrons. The proton is donated from a water molecule, resulting in a hydroxide formed.

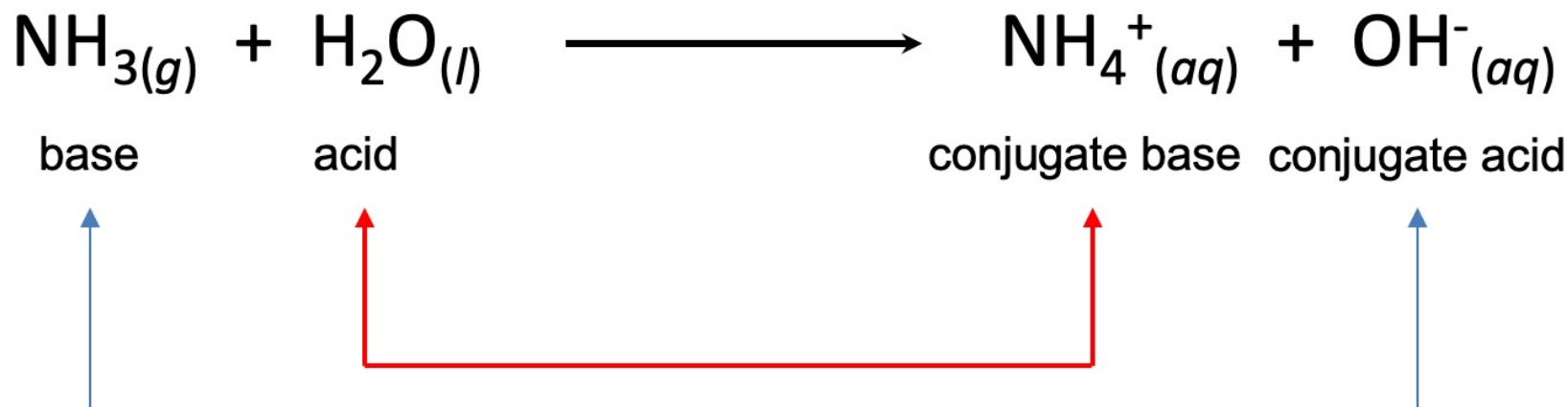


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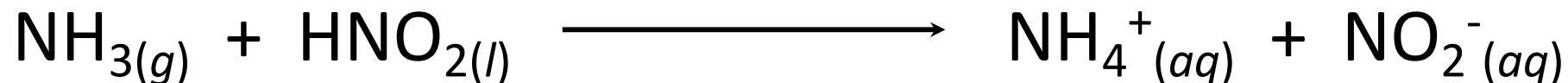
Conjugate Acids and Bases

- When a Bronsted-Lowry acid donates a proton, the molecule left over is the conjugate base of the acid

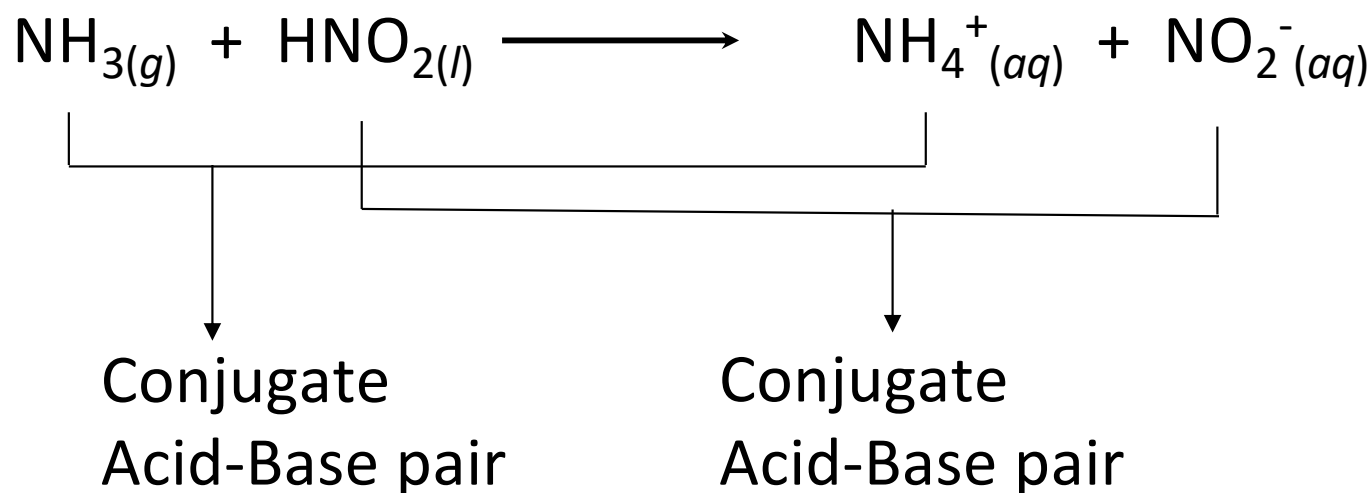
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Example



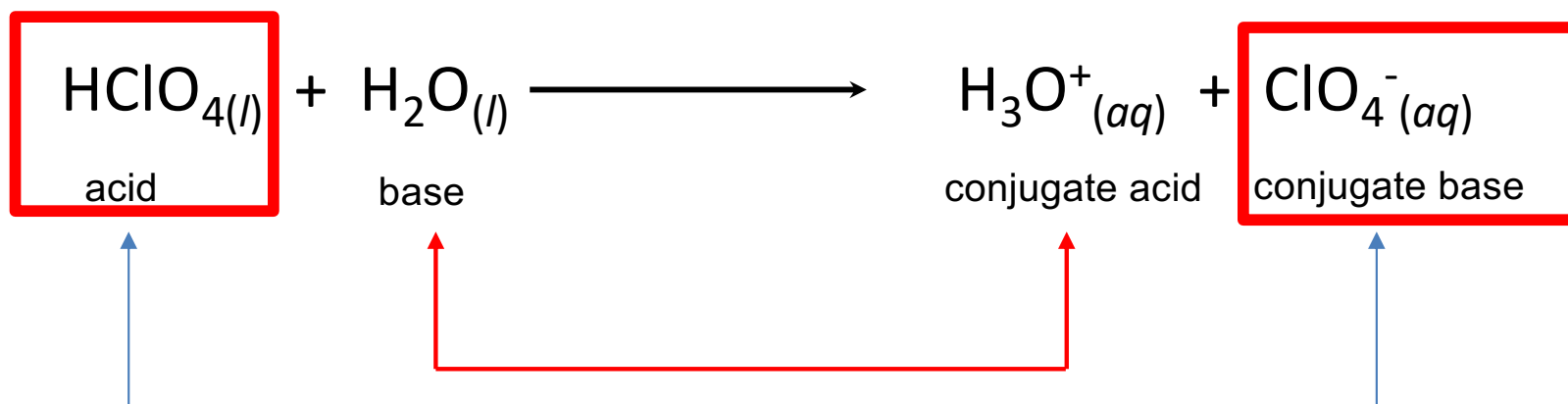
- _____
- HNO_2 loses the H^+ (proton donor) to become NO_2^- , making it the acid



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Recognizing Conjugate Acid/Base Pairs

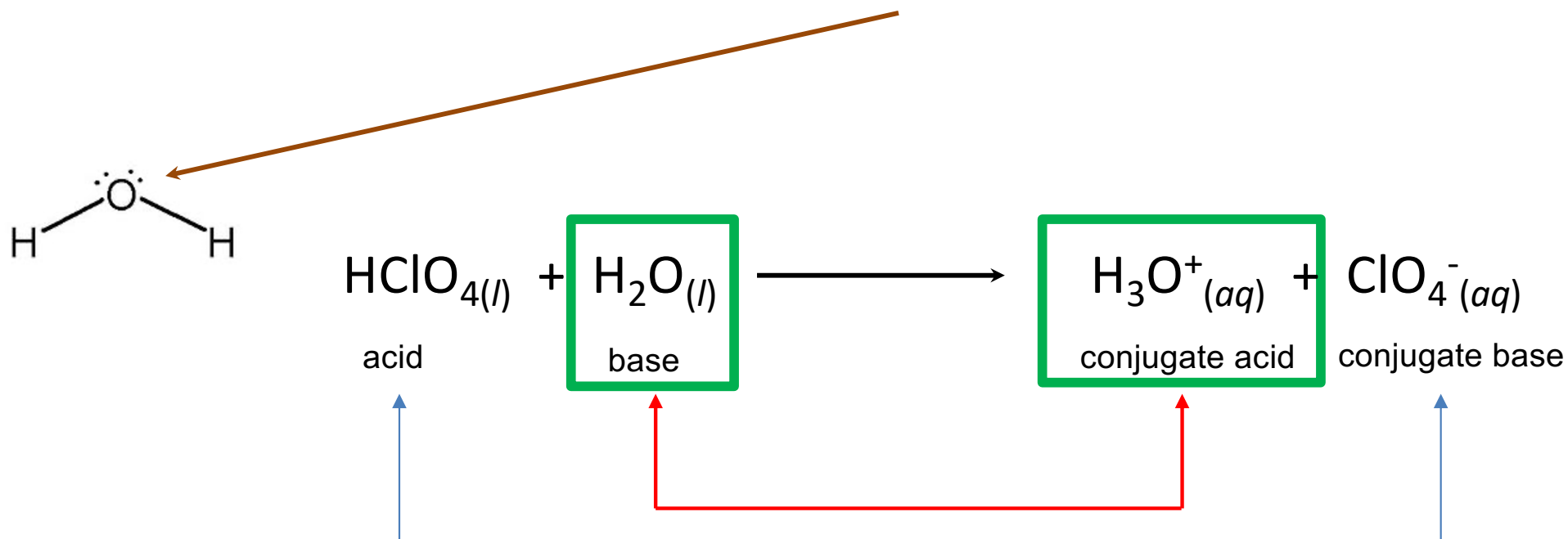
- Acid must have 1 more hydrogen than conjugate base



- If an acid is neutral, conjugate base must be an anion

Conjugate Acid and Base

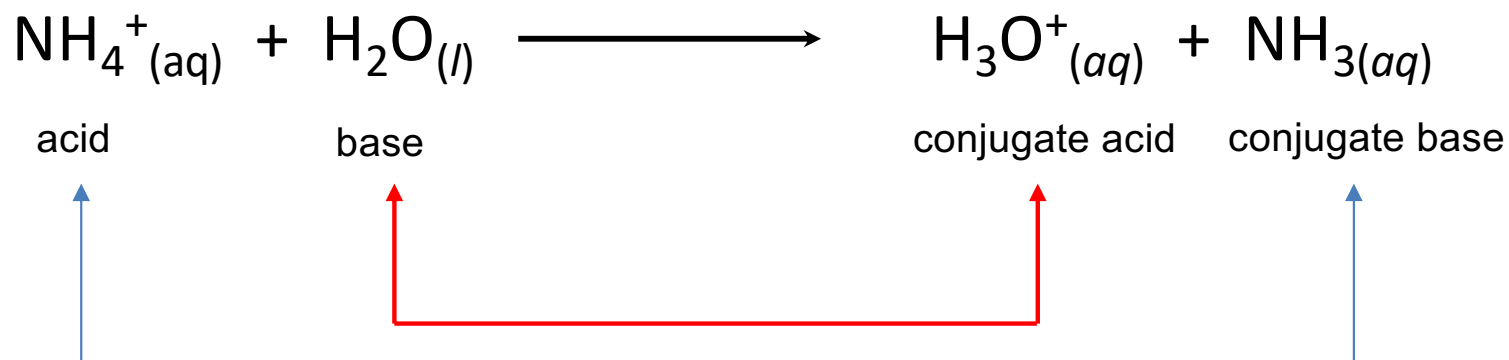
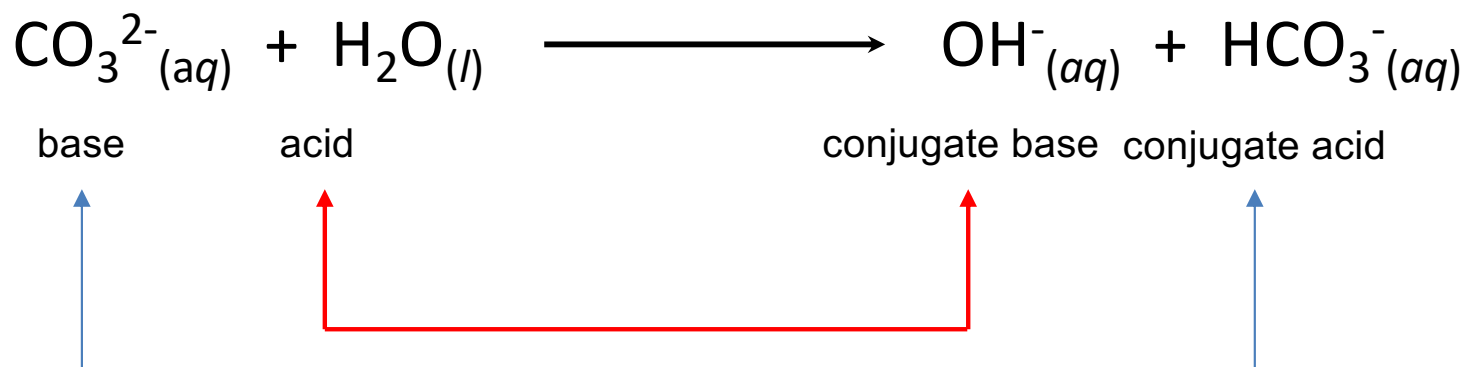
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- Lone pair should be on an electronegative element
- Must have

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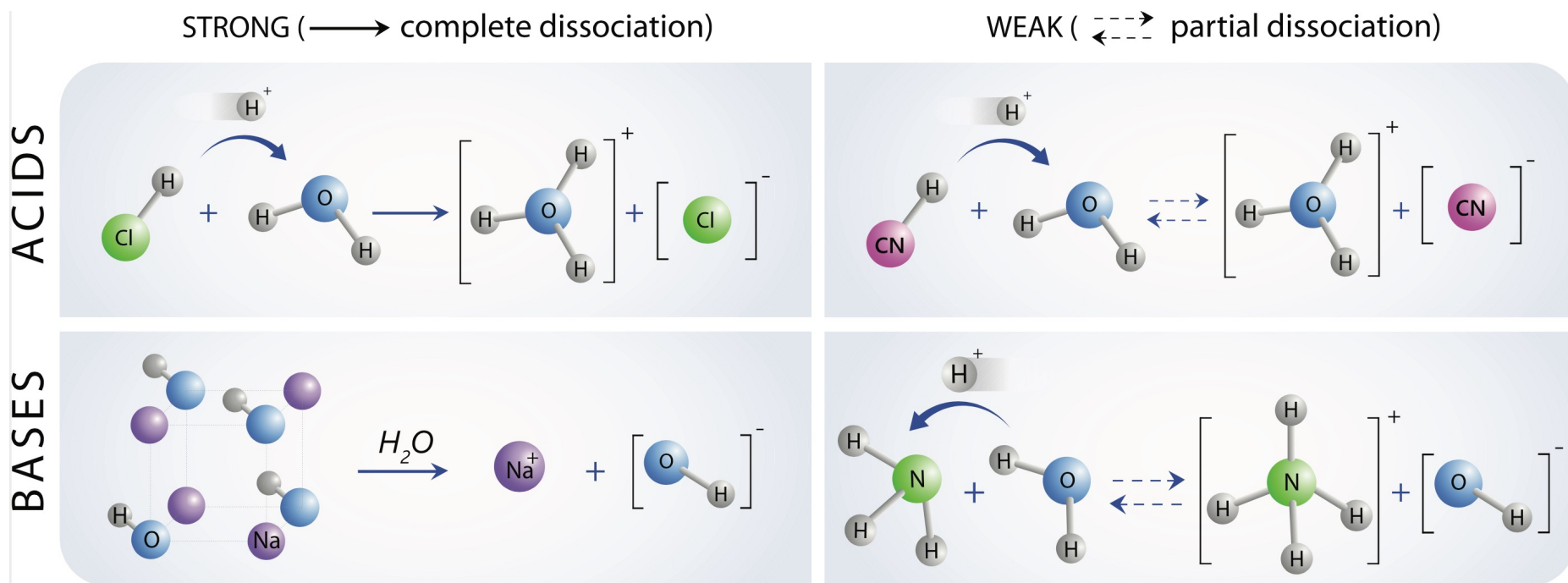
Bronsted-Lowry Theory with Common Salts



Strong vs. Weak Acids and Bases

- A strong acid is when protons completely ionize/dissociate when dissolved in water

- _____



Weak Acids and Bases

- Many common products that we consume are mildly acidic or basic and they do not impact our health
- I.e., Acetic acid (Vinegar)

