

Acid base theories section review answer

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Theories of Acid-Bases**

The Bronsted-Lowry Theory

According to the Bronsted-Lowry theory, an acid is a substance that donates a proton (H^+), while a base is a substance that accepts a proton. In an acid-base reaction, the acid transfers a proton to the base.

The Lewis Acid-Base Theory

The Lewis acid-base theory generalizes the Bronsted-Lowry theory. In this theory, an acid is defined as a substance that can accept an electron pair, while a base is a substance that can donate an electron pair.

The Theory of Acid-Base Experiments

This theory states that in an acid-base reaction, the reactants will form a conjugate acid-base pair. For example, when acid 1 (HA) reacts with base 2 (B^-), the products will be the conjugate acid of base 2 (HB^+) and the conjugate base of acid 1 (A^-).

Is a proton has been transferred from acid 1 to base 2 in the above reaction True or false?

True

Principles of Acid-Base Theory

- Acids and bases react in stoichiometric amounts to form salts and water.

- The strength of an acid or base is determined by its dissociation constant (K_a or K_b).
- Acid-base reactions are reversible.

Theories of Acid-Base Titration

- **Strong Acid-Strong Base Titration:** The equivalence point is at pH 7.
- **Weak Acid-Strong Base Titration:** The equivalence point is above pH 7.
- **Strong Acid-Weak Base Titration:** The equivalence point is below pH 7.

Concept of Acid and Base

- **Acid:** A substance that releases protons or accepts electrons.
- **Base:** A substance that accepts protons or releases electrons.

Lewis Concept of Acid and Base Classification

- **Acid:** Electron-pair acceptor
- **Base:** Electron-pair donor

Theory of Acid-Base Indicators

Acid-base indicators are substances that change color depending on the pH of the solution. They typically have a weak acid or base functional group that undergoes a protonation or deprotonation reaction.

pH Acid-Base Theory

The pH scale measures the acidity or alkalinity of a solution. It is defined as the negative logarithm of the hydrogen ion concentration ($[H^+]$).

Theory of Acid-Base Catalyst

Acid-base catalysts are substances that speed up acid-base reactions by providing a pathway for proton transfer.

Why are acid-base reactions often called proton transfer reactions?

Because they involve the transfer of protons from acids to bases.

Are electrons transferred in an acid-base reaction?

Yes, if the Lewis theory is used.

Do acids release or accept protons?

Release

Theories Involved in Acid-Base Indicators

- **Ostwald Theory:** Indicators are weak acids or bases that change color because they undergo protonation or deprotonation.
- **Hybridization Theory:** Indicators change color because they undergo a change in hybridization from sp^3 to sp^2 or vice versa.

The Most Common Acid-Base Theory

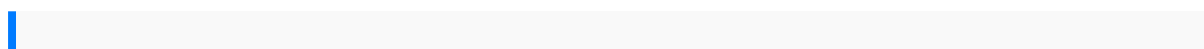
Bronsted-Lowry theory

Davy's Theory of Acid Bases

States that an acid is a substance that reacts with metals to produce hydrogen gas.

Stuart Theory Acid-Base

States that an acid is a substance that can neutralize a base and vice versa.



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