

Chemical Compounds

Chapter 15 – 3

Solutions of Acids and
Bases



Essential Questions

- What is the difference between strong acids and weak acids?
- What is the difference between strong bases and weak bases?
- How do you identify acids and bases by using the pH scale?
- How are salts formed and what are some uses for salts?



Definitions

- Neutralization reaction – reaction of an acid and a base to form a neutral solution of water and a salt
- pH – value used to tell how acidic or basic a solution is
- **Alkalinity – measurement of how acidic or basic something is**
- Salt – an ionic compound that forms when a metal atom replaces the hydrogen of an acid



Strengths of Acids and Bases

- Can be strong or weak
- Strength is **NOT** the same as concentration
 - Strength – number of molecules that break apart when acid or base is dissolved in water
 - Concentration – amount of acid or base dissolved in water



Strong Versus Weak Acids

- If ALL molecules of acid break apart (making hydrogen ions), it is strong
 - EX: sulfuric acid, hydrochloric acid
- If a FEW molecules break apart (making hydrogen ions), it is weak
 - EX: citric acid, carbonic acid



Strong Versus Weak Bases

- If ALL molecules of base break apart (making hydroxide ions), it is strong
 - EX: sodium hydroxide, calcium hydroxide
- If a FEW molecules break apart (making hydroxide ions), it is weak
 - EX: ammonium hydroxide, aluminum hydroxide



Acids, Bases and Neutralization

- Acids and bases can neutralize each other
 - Hydrogen ions (H^+) and hydroxide ions (OH^-) join to form water (H_2O), which is neutral
 - If water evaporates, the ions form salt



pH Scale

- Indicators can show how alkaline a solution is (how acidic or basic)
 - EX: Litmus paper, pH meters
- pH scale measures alkalinity
 - 1 is most acidic
 - 7 is neutral
 - 14 is most basic



pH and the Environment

- Living things have to have a steady pH
 - One reason organisms live in certain areas
 - Explains why fertilizers are sometimes needed (changes pH of the soil)



Salts & its' Uses

- When acids & bases neutralize, water and a salt are formed
- Many types of salt (not just table salt)
- Uses include:
 - Seasoning food
 - Thawing ice
 - Food preservation
 - Many others

