

CHEMISTRY CONTENT FACTS

The following is a list of facts related to the course of Chemistry. A deep foundation of factual knowledge is important; however, students need to understand facts and ideas in the context of the conceptual framework. This list is not intended to provide a comprehensive review for State and National Assessments. Its purpose is to provide a highlight of the factual material covered in Chemistry. This list is not all inclusive, be sure to check Nevada State Standards and your district syllabi.

Acids and Bases

- **Electrolyte** –a compound that conducts electricity when melted or dissolved in aqueous solution.
Usually ionically or polarly covalently bonded
- **Non-electrolyte** - a compound that does not conduct electricity in solution or when melted, non-polar covalently bonded
- **Arrhenius theory of Acid** forms H^+ ion, as the ONLY + ion in water solution, **Base** forms OH^- ion
- **Bronsted-Lowry Theory** - **Acid** = proton donor (loses H^+), **Base** = proton acceptor (gains H^+)
- **Salt** - a metal combined with a nonmetal [ex. NaCl, Na is the metal & Cl is the nonmetal]
- **Organic compounds**- contain with C. i.e. $C_6H_{12}O_6$ - usually NOT electrolytes. Except organic acids [functional group $-COOH$]
- **Traits of Acids**
 - Turns blue litmus red
 - pH less than 7.0
 - Reacts with metals to form salt and H_2 gas
 - Taste sour
 - React with base to form salt and water (neutralization)
 - The more they ionize, the better they conduct electricity
 - Contain more H^+ (H_3O^+) than (OH^-)
- **Traits of bases**
 - Turns red litmus blue, pink in phenolphthalein
 - pH greater than 7.0
 - Reacts with acids - neutralization
 - Taste bitter
 - Feel slippery
 - The more they dissociate or ionize, the better they conduct electricity
 - They contain more OH^- than H^+ (H_3O^+)
- **Neutralization** - **Acid** + **Base** \rightarrow salt + water $H^+ + OH^- \rightarrow H_2O$ (net reaction) for strong acid and base
- In neutralization, moles of acid and moles of base must be **equal**

- Formula for **titration (neutralization)**
 - $\text{ACID [Molarity]} \times [\text{liters}] = \text{BASES [Molarity]} \times [\text{liters}]$
- List of conjugate acid-base pairs - Strongest acid = largest K_a and Weakest acid = smallest K_a
- **Amphoteric or amphiprotic** - substance can behave as an acid or a base ex. Al(OH) or H_2O
- It should be noted that Group 1 and 2 are strong bases when combined with OH^- ; Bases [OH^- combined with a metal] get weaker as you move across the periodic table from left to right

