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.

Organic Chemistry

- **Hydrocarbons** - contain only hydrogen and carbon
- **Homologous series** - successive members differ by -CH_2 groups.
- **Alkanes** - C_nH_{2n+2} contain ALL single bonds - saturated compounds, ending is - ane
- **Alkenes** - C_nH_{2n} contain one double bond - unsaturated compounds ending are - ene
- **Alkynes** - C_nH_{2n-2} contain one triple bond - unsaturated compounds ending is - yne
- **Atomic Compounds** – Based on benzene's structure (C_nH_{2n-6}), toluene is related
- **Naming compounds –** follow the IUPAC rules
- As the volume of each of these homologous series increase so to do their boiling points and melting points due to an increase in the van der Waals forces.
- **Properties of *organic molecules*** - non-electrolytes, low boiling points. & melting points, generally insoluble in polar solvents (like water), react slowly & are molecular in structure
- **Isomers** - have the same chemical formula but a different structural formula
- General formulas for functional groups:
    - Alcohols**:** R –OH
    - Organic acids: R-COOH
    - Ester: R_1 - COO - R_2
    - Ketones: R_1 – CO – R_2 [the oxygen is double bonded to a non terminal carbon]
    - Ethers: R_1 – O – R_2 [the oxygen connects two carbon chains]
    - Aldehydes: R – COH [the oxygen is double bonded to the terminal carbon]
- Organic reactions to know
    - **Addition** - adds a pair of halogens to an unsaturated hydrocarbon. One product.
    - **Substitution** - adds a halogen to a saturated hydrocarbon. Two Products.
    - **Esterfication** - acid + alcohol → ester + water
    - **Fermentation** - $C_6H_{12}O_6$ → alcohol + carbon dioxide
    - **Polymerization** - n (C_2H_4) → $(C_2H_4)_n$
    - **Combustion** - hydrocarbon + oxygen → carbon dioxide + water
    - **Cracking** - the separation of a polymer