

# 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.

## Nuclear Chemistry

- Radioactive Nuclide Emissions

TYPE	SYMBOL	CHARGE
Alpha Particle	${}^4_2\text{He}$	2+
Beta Particle	${}^0_{-1}\beta$	1-
Gamma Particle	$\gamma$	0

- Half-life is the time required for one half of the atoms in a radioactive nuclide to decay
- Sample decay equations
- Alpha emission
- ${}^{210}_{84}\text{Po} \rightarrow {}^{206}_{82}\text{Pb} + {}^4_2\text{He}$
- Beta emission
- ${}^{14}_6\text{C} \rightarrow {}^{14}_7\text{N} + {}^0_{-1}\beta$
- Gamma emission - No equation; nucleus changes from excited energy state to lower energy state
- Nuclear fission occurs when a very heavy nucleus splits into more stable nuclei of intermediate mass, releasing very large amounts of energy  ${}^1_0\text{n} + {}^{235}_{92}\text{U} \rightarrow {}^{140}_{56}\text{Ba} + {}^{93}_{36}\text{Kr} + 3 {}^1_0\text{n}$
- Nuclear fusion occurs when light mass nuclei combine to form a heavier, more stable nucleus
  - $4 {}^1_1\text{H} \rightarrow {}^4_2\text{He} + 2 {}^0_{-1}\beta$
- Nuclear chemistry is used for processes such as radioactive dating; destruction of cancer cells; radioactive tracing in agriculture, medicine, and industry; and preserving food by killing bacteria and mold spores
- Nuclear waste must be isolated and allowed to decay without the radiation producing harmful effects to the environment and its inhabitants