Exam Title: 2003340 Chemistry
Courses Assessed by this Exam: Chemistry Edited 12.1.15

Key Vocabulary: solubility, controlled experiment, inference, validity, scientific investigation, pseudoscience, Law of Conservation of Mass, model, radioactive decay, carbon cycle, topographic model, geological strata, hydrological cycle, intermolecular forces, chemical properties, physical properties, melting point, density, atomic number, protons, neutrons, electrons, ionic bonding, hydrogen bonding, van der Waals forces, London dispersion forces, covalent bond, ionic bond, decomposition, double displacement, single displacement, synthesis, neutralization, kinetic energy, potential energy, electromagnetic radiation, frequency, wavelength, gas laws, catalyst, reactants, products, exothermic, endothermic, equilibrium, activation energy, sublimation

Student Tasks:

- Be able to make inferences when given a solubility curve.
- Identify a controlled experiment from scientific questions.
- Understand the concept of electroplating and electrochemical reactions.
- Understand the components of valid scientific experimentation (dependent variable, independent variables, hypothesis, repetition, replication, observations, inferences).
- Be able to differentiate between true science and pseudoscience.
- Understand the Law of Conservation of Mass and its limitations.
- Understand the importance of atomic models and how they evolved over time.
- Be able to differentiate between various cycles and models and understand their importance. (hydrological, carbon, topographic, nitrogen, geological strata)
- Know the difference between a physical and chemical change and examples of both. (Including but not limited to reactivity, mass, density, pH, melting point, magnetic, heat of combustion, etc..)
- Differentiate between physical and chemical properties. (Including, but not limited to, density, ductility, viscosity, and flexibility)
- Differentiate between atomic mass and atomic number.
- Be able to produce a model of an element or ion.
- Identify the reactivity of elements based on their number of valence electrons.
- Understand chemical behavior based on periods and groups on the periodic table.
- Understand hydrogen bonding and how it contributes to various properties of water.
- Know the differences and examples of the following types of bonds: ionic, covalent, hydrogen, van der Waals, London dispersion, double bond, triple bond,

- Be able to differentiate between strong bonds and weak bonds. Give examples)
- Understand how elements within specific groups of the periodic table typically bond with one another.
- Be able to interpret an empirical formula.
- Be able to make an inference of what an element might be if given a partial molecular model.
- Be able to differentiate visual representations of double replacement and single replacement reactions.
- Be able to classify a reaction as a double displacement, single displacement, combustion, and/or a neutralization reaction.
- Be able to correctly balance a chemical equation.
- Understand how to calculate molar mass and project the outcome of a reaction if given the reactants.
- Understand the concept of pH scale and common pH of chemicals.
- Understand the relationship between temperature and kinetic energy.
- Understand the relationship between kinetic and potential energy as it relates to various models (**chemical reactions, orbits around a central body, motion of a pendulum.**)
- Be able to differentiate between endothermic and exothermic reactions.
- Describe the quantization of energy at the atomic level.
- Understand the relationship between radiation energy, frequency, and wavelength.
- Be able to differentiate between chemical and nuclear reactions.
- Understand the role of activation energy in a chemical reaction.
- Understand how energy changes as electrons change from an excited state to ground state and vice versa.
- Interpret the behavior of ideal gases in terms of kinetic molecular theory (Relationship between volume, pressure, temperature and density).
- Understand various phase changes as they relates to kinetic molecular theory.
- Understand how temperature affects rates of reactions.
- Understand how catalysts affect activation energy.
- Know reaction conditions that lead to an increase in reactants and/or products.