

Science 10 Module 2 Test Outline

For this test you should be able to:

- demonstrate knowledge of the three subatomic particles, their properties, and their location within the atom
- define and give examples of *ionic bonding* (e.g., metal and non-metal) and *covalent bonding* (e.g., two non-metals, diatomic elements)
- with reference to elements 1 to 20 on the periodic table, draw and interpret Bohr models, including protons, neutrons, and electrons, of:
 - atoms (neutral)
 - ions (charged)
 - molecules - covalent bonding (e.g., O₂, CH₄)
 - ionic compounds (e.g., CaCl₂)
- identify valence electrons using the periodic table (excluding lanthanides and actinides)

- draw and interpret Lewis diagrams showing single bonds for simple ionic compounds and covalent molecules (e.g., NaCl, MgO, BaBr₂, H₂O, CH₄, NH₃)
- explain the significance of the pH scale, with reference to common substances
- differentiate between acids, bases, and salts with respect to chemical formulae and properties recognize the names and formulae of common acids (e.g., hydrochloric, sulphuric, nitric, acetic)
- identify acids and bases using indicators (e.g., methyl orange, bromthymol blue, litmus, phenolphthalein, indigo carmine)
- use the periodic table to
 - explain the classification of elements as metals and nonmetals
 - identify the relative reactivity of elements in the alkali metal, alkaline earth metal, halogen, and noble gas groups
- use the periodic table and a list of ions (including polyatomic ions) to name and write chemical formulae for common ionic compounds, using appropriate terminology (e.g., Roman numerals)
- convert names to formulae and formulae to names for covalent compounds, using prefixes up to "deca"

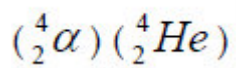
- define organic compounds and inorganic compounds
- distinguish between organic and inorganic compounds, based on their chemical structures
- recognize a compound as organic or inorganic from its name, from its chemical formula, or from a diagram or model
- define and explain the law of conservation of mass
- represent chemical reactions and the conservation of atoms using molecular models
- write and balance (using the lowest whole number coefficients) chemical equations from formulae, word equations, or descriptions of experiments
- identify, give evidence for, predict products of, and classify the following types of chemical reactions:
 - synthesis (combination)
 - decomposition
 - single and double replacement
 - neutralization (acid-base)
 - combustion
- explain how factors such as temperature, concentration, presence of a catalyst, and surface area can affect the rate of chemical reactions
- define isotope in terms of atomic number and mass number, recognizing how these are communicated in standard atomic notation (e.g., Uranium-238:



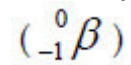
relate radioactive decay (e.g., alpha – α , beta – β , gamma – γ) to changes in the nucleus

- relate the following subatomic particles to radioactive decay:
 - proton
 $({}^1_1\text{p})$
 - neutron
 $({}^1_0\text{n})$
 - electron
 $({}^0_{-1}\text{e})$

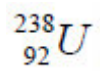
- alpha particle



- beta particle



- explain half life with reference to rates of radioactive decay
- compare fission and fusion
- complete and balance nuclear equations to illustrate radioactive decay, fission, and fusion
- interpret atomic notation eg



- identify the diatomic molecules (HI BrONFCI)