

Atomic Structure, Radioactivity

Atom smallest particle that retains properties of element

Composed of subatomic particles: electrons, protons and neutrons

Electrons 'orbit' the nucleus of protons and neutrons

Nucleus made of neutrons and protons; proton number is atomic number; number of protons determines the element. Isotopes have the same number of protons, but different numbers of neutrons. Nearly all of mass in nucleus.

Proton + electron = neutron

Radioactive decay of unstable isotopes gives off several forms of radiation

Alpha decay is release of two protons and two neutrons.

Beta decay is release of electron.

Gamma rays are photons released from nucleus to reach 'rest' state.

Know the effect of types of decay on the atomic mass and atomic number of the parent isotope. Be able to determine new element created by decay.

Half life is the amount of time for one half of a radioactive substance to decay from parent atoms to daughter products. (There are no parent products!). Be able to calculate amounts of material, ages of substances, or length of half life from information about the radioactive decay of isotopes in materials.

Chemistry

Have a general knowledge of what the periodic table can tell you: columns are groups of elements with similar physical properties, arranged by the number of valence electrons. Be able to draw an electron dot structure diagram and predict the ions formed by reference to the periodic table.

Know the valence (charge amount and character) of the alkali metals, alkaline earth metals, Oxygen group, halogens and how to combine them into molecules with no residual charge.

Be able to balance chemical equations! Molecular formulas cannot be changed; reactants or products cannot be introduced or removed; only ratios of them can be changed

Molecular equations of methane, propane, oxygen gas, water, carbon dioxide, hydrogen gas, nitrogen gas.

Know the chemical formulas of methane, coal, propane

Determine molecular weight of molecules from known atomic weights.

Determine molar quantities from known weights of substances.

Know how to find gram quantities from chemical equations, if you have to balance the equation, calculate the molar mass, and find the moles.