Unit: 5. CHEMISTRY REVIEW

GLOSSARY AND CREDITS

This section is a review of the Chemistry series. You may find it necessary to refer to the periodic table during this review.

VOCABULARY

accuracy	The correctness of measurement.
alpha particle	Helium nucleus emitted from the nucleus of a decaying isotope.
atom	The simplest unit of an element that still retains the properties of that element.
Avogadro's hypothesis	A hypothesis that equal volumes of gas under equal conditions have equal numbers of molecules.
Avogadro's number	The number of particles in a mole = 6.02×10^{23} .
beta particle	An electron or particle similar to an electron with negligible mass and a charge of -1; represented by β^{-} .
Boyle's Law	The inverse relationship between pressure and volume of gases such that as pressure increases, volume decreases by the same fraction of change; temperature and number of molecules remain constant.
Charles' Law	The direct relationship between temperature and volume of gases such that as temperature (absolute scale) increases, volume increases by the same fraction of change; pressure and volume remain constant.

chemical charge	A charge that causes the starting materials to completely lose their properties to form new and distinctly different substances.
colloid	A uniform dispersion, heterogeneous in nature between two or more substances.
Combined Gas Law	The mathematical relationship which allows the three variables of pressure, volume, and temperature to change simultaneously; this law is derived from combining Boyle's and Charles' Laws into one.
compound	Two or more elements joined together such that the elements have lost their individual identity in favor of a new set of properties.
covalent bond	A chemical bond between atoms with similar electronegativities; valence electrons are shared.
daughter	The nuclide produced from a radioactive decay.
deductive reasoning	A prediction made or conclusion drawn from insight gained from an established principle.
diffusion	The process of intermingling atoms (molecules) from one substance into another by random molecular motion.
direct relationship	When two variables change in the same direction, one remaining larger than the other by the same factor.
electronegativity	A measure of the ability of atoms to attract (gain) electrons.
electron	A negative particle basic to matter; symbolized by a (-), e-, or $p\sim$; located outside the nucleus; in constant motion; 1/1,837 the mass of a proton.
element	A primary substance that cannot be divided into separate substances; one of about 112 different basic varieties of matter making up the universe.
endothermic	A reaction that absorbs energy is endothermic; endothermic means to absorb energy.

energy level	The broad bands or regions located around the nucleus where the electrons are found.
enthalpy	The energy in atoms and molecules that hold the substances together; enthalpy is referred to as bonding energy.
equation	The symbolic representation of a chemical reaction based on the Conservation of mass (atoms).
equilibrium	Equilibrium is a dynamic state where two opposing forces are in balance, where two opposite events are occurring at equal rates; the building process is equal in rate to the tearing-down process.
exothermic	Releasing heat.
gamma ray	High energy ray of energy emitted from some radioactive atoms.
group	The vertical column of the periodic table; groups have similar valence electron structure and similar chemical and physical properties.
heat of reaction	The amount of heat released or absorbed by a reaction. (H_r)
heterogeneous	Composed of dissimilar parts which can be separated easily and which are unevenly distributed in the mixture.
homogeneous	Even distribution of parts throughout the whole mixture; not easily separated into individual components.
hypothesis	An initial proposed explanation for the phenomenon.
inorganic	From nonliving material.
inverse relationship	When one variable becomes larger by a given factor and the other variable becomes smaller by the same factor.
ion	Atom or group of atoms with a net charge caused by unequal numbers of electrons and protons.
ion charge	The electron charge an atomic particle carries.

ionic bond	A bond between atoms of greatly differing electronegativities; a separation of one or more valence electrons from one atom (low electronegativity) toward another (high electronegativity); bonds exist between unlike electrical charges (+ and - ions).
ionization energy	The energy necessary to overcome the attractions of electrons to the nucleus of an atom so as to remove electrons from the atom.
isotope	A member of the same element (same atomic number) but different mass number due to different numbers of neutrons in the nucleus.
kinetic energy	The energy of motion which is represented as K.E.=1/2 mv^2 where m = mass, and v = velocity of the particle in motion.
Kinetic Molecular Theory	The theory that all matter is particulate, in continuous motion, and increasingly spread out from solids to gases.
law	A relationship that is accepted as true and no longer needs to be tested and verified.
length	The measure of the distance from one point to another.
mass	A measure of the quantity of matter in an object.
mass defect	The difference between the mass of a nucleus and the sum of masses of its components; equivalent to binding energy according to $E=mc^2$.
mass number	The number of protons plus neutrons in the nucleus.
metal	The group of elements that are good conductors of electricity and heat; solids except for mercury.
metallic bond	The bond formed in metals, holding metals together; delocalized bond with very fluid, mobile electrons; nondirected bond with valence electrons in a "community" relationship to many nuclei; electron mobility accounts for ease of electrical conductivity.

mixture	Two or more substances dispersed in one another but each retaining their own identity.
mole	One atomic weight of an atom or molecular weight of a molecule expressed in grams; one mole of any substance contains 6.02 x 10 ²³ atoms or molecules; one mole of any gas at STP will occupy 22.4 L.
neutron	Neutral particle found in the nucleus; mass about equal to that of a proton; neutrons plus protons constitute mass of atom.
nonmetal	The group of elements that are poor conductors of electricity and heat; mostly liquids and gases.
nucleus	The central core of the atom containing most of the mass and made up of protons and neutrons.
nuclide	The isotope of a radioactive element.
organic	Compounds that contain the element carbon.
parent	The beginning nuclide in the radioactive decay chain.
period	The horizontal row in the periodic table.
phase change	A change from one state of matter to another.
physical change	A change in shape, size, or physical characteristics but remaining the same substance.
polar	An unequal, unbalanced distribution of electrons in a molecule causing one portion to be (+) and another to be (-).
polarity	The measure of the degree of charge separation within a polar molecule.
precipitate	The solid formed as a result of chemicals reacting together from a solution.
precision	How spread out the results of an experiment are or, how repeatable measurements are; often dependent on the certainty with which an estimation can be made.

presupposition	Initial idea which is believed to be true and is used as a basis (starting point) from which further reasoning and conclusions are made.
product	The substance formed as a result of a chemical reaction.
proton	One of the particles of the nucleus; positively charged; symbolized by (+) or p; assigned a mass value of 1 unit; protons plus neutrons constitute mass of atom.
quantum	Energy available or given off in specific, predictable quantities.
radioactive	Unstable and capable of disintegrating into different elements, producing radiation and energy.
reactant	One of the starting substances (ingredients) that is involved in a chemical reaction.
solute	The substance dissolved in a solution.
solution	A uniform mixture of molecules or ions of one substance in another.
solvent	That component of a solution which dissolves the solute.
spectrum	The distribution of light when passed through a prism or other device that breaks the light into its individual components.
suspension	A temporary heterogeneous mixture that separates into individual components with time.
theory	A generalized model used to explain observations, to answer questions, and to predict answers to related evidence and problems.
volume	Space occupied by a quantity of matter.