

In this document, you will find the key words and their associated definitions for **Chemistry A.**

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| Unit 1: Course Overview |
| Unit 2: Introduction to Chemistry |
| Lesson 2: Physical vs. Chemical Change | * **chemical change** – change that involves a change in composition; also called a chemical reaction
* **chemical properties** – characteristics used to describe how a substance changes or does not change its composition when interacting with other substances
* **composition** – the chemical makeup of a substance
* **compound** – a pure substance composed of two or more elements
* **element** – a pure substance that cannot be changed into simpler substances through chemical or physical means
* **extensive properties** – characteristics that depend on the amount of substance present
* **heterogeneous mixture** – a mixture in which the properties and composition varies from one sample to another
* **homogeneous mixture** – a mixture that has uniform properties and composition in each sample
* **intensive properties** – characteristics that do not depend on the amount of substance present
* **matter** – anything that has mass and volume
* **mixture** – a physical combination of two or more substances
* **molecule** – a group of atoms bonded together, representing the smallest fundamental unit of a chemical compound that can take part in a chemical reaction
* **physical change** – change that does not involve a change in composition
* **physical properties** – characteristics used to describe matter that are not associated with changing its chemical makeup
* **properties** – characteristics that are used to describe a substance
* **proton** – a positively charged particle that makes up the nucleus of an atom
* **pure substance** – matter that has a definite composition
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| Lesson 3: Mixtures | * **chemical properties** – characteristics used to describe how a substance changes or does not change its composition when interacting with other substances
* **physical properties** – characteristics used to describe matter that are not associated with changing its chemical makeup
* **pure substance** – matter that has a definite composition
 |
| Lesson 4: Atomic Composition | * **atom** – the basic unit of a chemical element
* **electron** – a negatively charged particle that is outside the nucleus of an atom
* **element** – a pure substance that cannot be changed into simpler substances through chemical or physical means
* **ion** – a charged particle that results when the number of protons and number of electrons differ
* **mass number** – the sum of the protons and neutrons that make up the nucleus of an atom
* **neutron** – a particle that has no charge that makes up the nucleus of an atom
* **proton** – a positively charged particle that makes up the nucleus of an atom
* **stable** – in atoms, the condition in which a nucleus is unlikely to undergo decay
 |
| Lesson 5: Atomic Composition of Molecules | * **atom** – the basic unit of a chemical element
* **bond angle** – the angle formed by the positions of the chemical bonds joining a central atom to two other atoms
* **crystal** – ions, molecules, or atoms held together in an ordered, three-dimensional arrangement
* **molecular structure** – the location of the atoms, groups, or ions relative to one another in a molecule, as well as the number, type, and location of covalent bonds
* **molecule** – a group of atoms bonded together, representing the smallest fundamental unit of a chemical compound that can take part in a chemical reaction
* **polymer** – substance composed of long chain of repeating units
* **valence shell electron pair repulsion (VSEPR) theory** – the idea that the repulsion of the pairs of electrons in the valence shell of the central atom of a molecule can be used to predict the electronic and molecular shapes of the molecule
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| Unit 3: The Periodic Table |
| Lesson 2: Atomic Number | * **actinoid** – elements in the bottommost of two rows that are set below the main periodic table
* **alkali metal** – the metals found in the first column on the left of the periodic table
* **alkaline earth metal** – the elements in the second column of the periodic table
* **brittle**– shatters easily
* **conductivity** – the ability to easily transmit heat energy or electricity
* **ductility** – the ability to be drawn into a wire
* **halogen** – the elements in the second column from the right of the periodic table
* **lanthanoid** – elements in the uppermost of two rows that are set below the main table
* **luster** – shine
* **malleability** – the ability to be hammered into thin sheets
* **metal** – an element that is lustrous (shiny), conducts electricity and thermal energy, is malleable (able to be hammered into a thin sheet), is ductile (able to be pulled into a thin wire), and often reacts with an acid
* **metalloid** – an element that is solid at room temperature and weakly conducts electricity and thermal energy
* **noble gas** – elements found in the right-most column of the periodic table
* **nonmetal** – an element that isn’t lustrous, poorly conducts electricity and thermal energy, and is brittle (shatters easily)
* **periodic table of elements** – a table that lists all the known chemical elements arranged by increasing atomic number as you go from left to right and from top to bottom
* **reactivity** – the ability to chemically react
* **transition metal** – elements located in the middle of the periodic table (columns 3 through 12)
* **valence electron** – an electron in the outer electron shell of an atom
 |
| Lesson 3: Stable Ions | * **atomic mass** – the mass of an atom
* **atomic number** – the number of protons in the nucleus of an atom
* **electron** – negatively charged particle orbiting the nucleus of an atom
* **energy level** – area surrounding the nucleus occupied by electrons; also known as orbitals or shells
* **group** – a column in the periodic table
* **isotope** – an atom with the same number of protons but different number of neutrons than indicated on the periodic table
* **neutron** – neutrally charged particle in the nucleus of an atom
* **nucleus** – small, dense region at the center of an atom composed of protons and neutrons
* **period** – a row in the periodic table
* **proton** – positively charged particle in the nucleus of an atom
* **representative elements series** – groups 1,2 and 13-18 on the periodic table, labeled IA – VIIIA
* **valence electrons** – electrons located in the outermost shell or energy level of an atom
 |
| Lesson 4: Valence Electrons 1 | * **electron configuration**– the arrangement of the electrons in an atom
* **energy level**– area surrounding the nucleus occupied by electrons; also known as orbitals or shells
* **group** – a column in the periodic table
* **period** – a row in the periodic table
* **representative elements series** – groups 1,2 and 13-18 on the periodic table, labeled IA – VIIIA
* **valence electron** – electron located in the outermost shell or energy level of an atom
 |
| Lesson 5: Protons and Isotopes | * **atomic mass** – the mass of an atom
* **atomic number** – the number of protons in the nucleus of an atom of an element; the number of protons an atom contains
* **average atomic mass** – the average of all naturally occurring isotopes of a given element weighted by their relative abundance
* **electron** – a subatomic particle with a negative charge that revolves around atomic nuclei
* **element** – a substance that cannot be broken down into simpler substances by chemical means
* **isotope** – one of two or more atoms of an element with the same atomic number but different mass number
* **isotope mass** – the mass of a particular isotope, usually given in atomic mass units (amu)
* **mass number** – the sum of the protons and neutrons that make up the nucleus of an atom of an element
* **neutron** – a subatomic particle in atomic nuclei with no electric charge and a mass slightly greater than the mass of a proton
* **proton** – a subatomic particle in all atomic nuclei with a positive electric charge equal to and opposite of the charge of an electron
* **reaction** – interaction between substances that leads to those substances changing chemically
 |
| Lesson 6: Historical Understandings | * **alpha particles** – positively-charged-nuclear particles that are identical to the nucleus of a helium atom with two protons and two neutrons
* **atom** – the smallest particle of an element that retains the properties of that element
* **atomic number** – the number of protons in an atom
* **atomic orbital** – regions around the nucleus of an atom in which there is a high probability of finding electrons
* **Coulomb force** – the interaction between positive- and negative-charged particles
* **electron** – negatively charged particle in an atom
* **elliptical orbit** – movement around an object in an oval shape
* **nucleus** – the dense, positively charged center of an atom that contains most of the mass of the atom
* **periodic** – repeating in intervals
* **periodic table** – a chart that arranges the elements in order of atomic number
* **plum pudding model** – early model of an atom proposed by J.J Thomson in which electrons are embedded throughout a mass of positively-charged material
* **Rutherford model** – model of an atom proposed by Ernest Rutherford in which electrons surround a dense nucleus
 |
| Lesson 7: Element Groupings | * **group**– column of elements on the periodic table
* **period** – row of elements on the periodic table
* **valence electrons** – electrons in the outermost energy level of an atom
 |
| Lesson 8: Element Arrangement | * **atomic number** – number of protons in the nucleus of an atom
* **element** – a substance whose atoms have a specified number of protons
* **isotopes** – two or more atoms of the same element with a different number of neutrons
* **Periodic Table of the Elements** – table that lists all the known chemical elements arranged by increasing atomic number from left to right and from top to bottom
 |
| Lesson 9: Reactivity | * **electronegativity**– the tendency of an atom to attract electrons to itself from an atom of another element
* **group**– vertical column of elements in the periodic table
* **period**– horizontal row of elements in the periodic table
* **valence electrons**– electrons in the outermost energy level of an atom
* **atomic radius** – the distance from the center of an atom's nucleus to its outer shell of electrons
 |
| Lesson 10: Bonds | * **compound**– a substance that is composed of two or more atoms that are bonded together
* **covalent bond**– chemical bond in which two atoms share electrons
* **ion** – a charged particle
* **ionic bond**– chemical bond in which one or more electrons is transferred from one atom to another
* **metallic bond**– chemical bond in which a positively charged metal ion and a loosely held valence electron are attracted
 |
| Lesson 11: Ions | * **atomic number** – the number of protons in the nucleus of each atom
* **element** – a substance that is made of only one type of atom
* **energy level** – the location where an electron is most likely to be located in an atom, based on the energy of the electron
* **ion** – a charged particle
* **ionic compound** – a substance that consists of oppositely charged ions
* **group –**vertical column in the periodic table; in their neutral states, each element in a group shares the same or similar number of valence electrons
* **period –**a horizontal row in the periodic table; in their neutral states, all elements in a period have the same number of energy levels
* **valence electron** – an electron in the outermost energy level
* **molar ratio** - the relationship between the amount of different elements that bond to create a compound or the relationship between the amount of any two compounds involved in a chemical reaction.
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| Unit 4: Solutions, Acids, and Bases |
| Lesson 2: Solutes and Solvents | * **concentration**– the amount of solute per unit of solution
* **exothermic process** – an activity that results in an overall release of energy
* **kinetic energy** – the energy of an object due to its motion
* **polar compounds –**compounds with a positive or negative (polar) charge
* **nonpolar compounds** – compounds with molecules that do not have a polar charge
* **solubility** – the ability of a solute to dissolve in a solvent
* **solute** – a substance that is dissolved in a solvent
* **solution** – a mixture made up of a solvent and a solute
* **solvent** – a substance that dissolves another substance
 |
| Lesson 3: Ions in Polar Solvents | * **covalent bond** – a bond in which electrons are shared between two atoms
* **ionic compounds** – compounds that form when electrons are transferred from one atom to another, forming ions
* **nonpolar compounds** – compounds with molecules that do not have polar charges
* **polar compounds** – compounds with molecules that have two ends with opposite charges
* **solvent** – a substance that dissolves another substance
 |
| Lesson 4: Solutions, Acids and Bases Portfolio 1 | * **conductivity** – how much a specific type of material is able to move electricity
* **covalent solution** – a solution that has covalent molecules dissolved in it
* **electricity** – the flow of electric charge caused by free-flowing electrons
* **ion** – an atom or molecule that is charged due to a gain or loss in electron(s)
* **ionic solution** – a solution that has ions dissolved in it
* **solution** – a liquid that is made out of a solvent (the majority of the content), with solutes (a minority of the content) dissolved in it
 |
| Lesson 5: Solutions, Acids and Bases Portfolio 2 | * **conductivity** – how much a specific type of material is able to move electricity
* **covalent molecule** – a molecule in which the atoms are bonded to each other by sharing electrons
* **covalent solution** – a solution that has covalent molecules dissolved in it
* **electricity** – the flow of electric charge caused by free-flowing electrons
* **insulator** – a material or substance that prevents the flow of electric charge
* **ion** – an atom or molecule that is charged due to a gain or loss in electron(s)
* **ionic solution** – a solution that has ions dissolved in it
* **solution** – a liquid that is made out of a solvent (the majority of the content) with solutes (a minority of the content) dissolved in it
 |
| Lesson 6: Solutions, Acids and Bases Portfolio 3 | * **conductivity** – how much a specific type of material is able to move electricity
* **covalent molecule** – a molecule in which the atoms are bonded to each other by sharing electrons
* **covalent solution** – a solution that has covalent molecules dissolved in it
* **electricity** – the flow of electric charge caused by free-flowing electrons
* **insulator** – a material or substance that prevents the flow of electric charge
* **ion** – an atom or molecule that is charged due to a gain or loss in electron(s)
* **ionic solution** – a solution that has ions dissolved in it
* **solution** – a liquid that is made out of a solvent (the majority of the content) with solutes (a minority of the content) dissolved in it
 |
| Lesson 7: Ph, Acids and Bases | * **acid** – a substance that releases H+ ions into a solution; a molecule or ion that can donate a proton (hydrogen ion H+) or form a covalent bond with an electron pair
* **base** – a substance that causes the release of OH-ions into a solution; substance that donates electrons, accepts protons, or releases hydroxide (OH−) ions in aqueous solutions
* **Brønsted-Lowry theory** – a theory which states that an acid is a molecule which donates a proton and a base is a molecule which accepts a proton
* **concentration (of an acid or base)** – the amount of acid or base in a solvent per unit volume
* **conjugate acid** – the positive ion created when a base accepts a proton
* **conjugate base** – the negative ion remaining after an acid donates a proton
* **electronegativity** – a measure of how strongly an atom attracts the electrons of another atom
* **hydronium ion** – an ion that adds acidity and lowers the pH in a solution; chemical formula H3O+
* **hydroxyl ion** – an ion that lowers acidity and increases the pH in a solution; chemical formula OH-
* **ion** – an atom or molecule that is charged due to a gain or loss of electron(s); an atom or molecule that carries an electric charge
* **pH scale** – a scale with values from 0 to 14 that indicates how acidic or basic a solution is; a logarithmic progression that measures the acidity of a substance
* **solution** – a liquid made out of a solvent (the majority of the content) with solutes (a minority of the content) dissolved in it
* **strength (of an acid or base)** – the relative ability of an acid or base to release ions into a solution
 |
| Lesson 8: Acid Base Solutions | * **acid**– a molecule or ion that can donate a proton (hydrogen ion H+) or form a covalent bond with an electron pair
* **acid strength** – how much an acid tends to dissociate into a proton, H+ and an anion, A−
* **base** – substance that donates electrons, accepts protons, or releases hydroxide (OH−) ions in aqueous solutions
* **base strength** – the ability to accept H+ from another substance
* **concentration**– the amount of solute per unit of solution
* **equilibrium concentration**– the amount that remains when all reactions are in equilibrium
* **initial concentration**– the amount added initially
* **pH** – a measure of the acidity or basicity of aqueous or other liquid solutions
* **pH scale** – a logarithmic progression that measures the acidity of a substance
 |
| Unit 5: Gases |
| Lesson 2: Gases Under Pressure | * **Boyle’s law**– the volume of a gas at a constant temperature (expressed in kelvins) varies with the pressure exerted on it
* **Charles’s law**– the volume occupied by a fixed amount of gas is directly proportional to its absolute temperature, if the pressure remains constant
* **combined gas law**– the relationships among pressure, temperature, and volume on an enclosed gas when  the amount of gas is constant
* **constant**– a fixed or unchanging value
* **directly proportional**– two variables move in the same direction in the same proportion
* **Gay-Lussac’s law**– pressure and temperature are directly proportional for temperatures expressed in kelvins
* **ideal gas**– a gas in which the molecules can be described as though they are hard spheres taking up virtually no space and bouncing off of each other in perfectly elastic collisions
* **Ideal Gas law**– brings together the relationships illustrated by Boyle’s law, Charles’s law, Gay-Lussac’s law, and the Combined Gas law
* **inversely proportional**– two variables move in opposite directions in the same proportion
* **Kelvin temperature scale**– a temperature scale having an absolute zero, below which temperatures do not exist; at absolute zero (0K) molecular energy is at a minimum
* **molar mass**– the mass in grams of one mole of a substance
* **mole** – an SI unit of measure that represent 6.02 x 1023 particles (e.g. atoms or molecules)
* **pressure**– force per unit area (In a gas it relates to the amount of collisions the gas molecules make per unit area with the surface of a container.)
* **STP**– Standard temperature and pressure; 1 atm and 273 K.
* **temperature**– a measure of the average kinetic energy per molecule
* **universal gas constant**– the ratio of the product of pressure and volume to the product of mole and temperature; 0.0821 L×atm/mol×K
* **volume**– a measure of how much space the molecules are taking up, or the size of the container they are confined within
 |
| Lesson 3: Gases Portfolio Day 1 | * **buoyancy**– the tendency of an object to float (or rise) when submerged in a fluid
* **Cartesian diver**– a device that demonstrates buoyancy and gas behavior in which a small container that is partially filled with gas is made to rise and sink in a larger container of water due to pressure changes; floats to the top or sinks to the bottom
* **density** – mass per unit volume; if an object is heavy and compact, it has a high density; if an object is light and takes up a lot of space, it has a low density
* **gas pressure** – the force per unit area that gas exerts on the walls of its container
* **swim bladder** – an internal gas-filled organ that helps many species of fish control their own buoyancy, without having to hold their vertical position by swimming
 |
| Lesson 4: Gases Portfolio Day 2 | * **Ideal Gas law** – brings together the relationships illustrated by Boyle’s law, Charles’s law, Gay-Lussac’s law, and the combined gas law
* **number of particles of gas** – the amount of gas present within the sampling area or surroundings and exerting pressure on the sampling area
* **pressure** – the force per unit area
* **temperature** – a measure of hotness or coldness on a definite scale that can be recorded within or surrounding the experimental set-up, may be held constant or used as a variable
* **volume** – the space taken up; the 3-D measure of the space occupied by a given quantity of a substance at a defined temperature and pressure
 |
| Lesson 5: Gases Portfolio Day 3 | * **buoyancy** – the tendency of an object to float (or rise) when submerged in a fluid
* **Cartesian diver** – a device that demonstrates buoyancy and gas behavior in which a small container that is partially filled with gas is made to rise and sink in a larger container of water due to pressure changes; floats to the top or sinks to the bottom
* **number of particles of gas** – the amount of gas present within the sampling area or surrounding it and exerting pressure on the sampling area
* **pressure** – force per unit area
* **volume** – the 3-D measure of the space occupied by a given quantity of a substance at a defined temperature and pressure
 |
| Unit 6: Simple Chemical Reactions |
| Lesson 2: Patterns of Properties | * **anion –** a negatively charged ion, meaning it has more electrons than protons
* **cation –** a positively charged ion, meaning it has more protons than electrons
* **chemical bonds** – forces that hold atoms together
* **chemical properties** – the characteristics of a substance that relate to its ability to change to other substances
* **chemical reaction** – process by which atoms of a substance are rearranged to form different substances
* **electron energy levels** – discrete energy levels that electrons of a given atom can occupy
* **groups** – columns of the periodic table
* **ions** – charged atoms
* **periodic table** – organization of all known elements into columns and rows based on atomic number
* **periods** – rows of the periodic table
* **valence electrons** – electrons that occupy the highest energy level of an atom
 |
| Lesson 3: Balance of Atoms | * **chemical reaction** – a process in which atoms in the reactant or reactants rearrange to form a new substance or substances
* **products** – the substances after a chemical reaction occurs
* **reactants** – the substances before a chemical reaction occurs
 |
| Lesson 4: Covalent and Ionic Bonding | * **covalent bond** – a force that holds atoms together by sharing electrons
* **electronegativity** – a value that describes the relative strength with which an atom of an element attracts electrons to itself in a chemical bond
* **ionic bond** – a force that holds oppositely charged atoms (or groups of atoms) together
* **polar covalent bond** – a force that holds atoms together by unequally shared electrons
* **valence electrons** – the electrons in the outermost orbitals of an atom
 |
| Lesson 5: Valence Electrons | * **atomic number** – number of protons in the nucleus of an atom
* **group** – a column of the periodic table
* **periodic table** – an organized chart of all known elements
* **valence electron** – electrons in the outermost energy level of an atom
 |
| Lesson 6: Patterns of Attraction | * **atomic radius –**half the distance between the nuclei of neighboring atoms of a solid element
* **combustion** – chemical reaction between a substance and oxygen
* **covalent bond** – force that holds atoms together by sharing electrons
* **electronegativity** – value that describes the relative strength with which atoms of an element attract electrons in a chemical bond
* **hydrocarbon** – type of compound made of carbon and hydrogen
* **ionic bond** – force that holds oppositely charged atoms (or groups of atoms) together
* **ionization energy** – energy needed to remove an electron from an atom
* **polar covalent bond** – force that holds atoms together by unequally shared electrons
 |
| Lesson 7: Chemical Equations | * **chemical formula** – notation that represents the elements and their ratios that make up a substance
* **valence electrons** – electrons in the outermost energy level of an atom
 |
| Lesson 8: Balanced Reactions | * **balanced chemical equation**– a chemical equation in which the number and types of atoms in the reactants are the same as in the products
* **coefficient** - a number placed in front of a chemical symbol or formula showing how many molecules of the substance are involved in the reaction
* **law of conservation of matter** – law of chemistry that states that matter cannot be created or destroyed
 |
| Lesson 9: Bonding of Atoms in Reactions | * **covalent bond** – force that holds atoms together by sharing electrons
* **electronegativity** – value that describes the relative strength with which an atom attracts electrons in a chemical bond
* **ionic bond** – force that holds oppositely charged atoms (or groups of atoms) together
* **polar covalent bond** – force that holds atoms together by unequally shared electrons
* **polyatomic ion** – an ion composed of two or more atoms that act as a unit
 |
| Lesson 10: Patterns of Reactivity | * **reactivity** – tendency of an element to undergo a chemical reaction
* **transition metal** – elements in groups 3 through 12 (or “B” groups) of the periodic table
* **valence electrons** – electrons in the outermost energy level of an atom
 |
| Lesson 11: Relative Electronegativity  | * **covalent bond** – force that holds atoms together by sharing electrons
* **electronegativity** – value that describes the relative strength with which atoms of an element attract electrons in a chemical bond
* **polar covalent bond** – force that holds atoms together by unequally shared electrons
* **valence electrons** – electrons in the outermost energy level of an atom
 |
| Lesson 12: Chemical Reaction Predictions | * **chemical bond** – force that holds atoms together
* **chemical reaction** – process by which the ionic or molecular structure of starting elements or compounds rearranges, converting those substances to different substances
* **covalent bond** – force that holds atoms together by sharing electrons
* **electronegativity** – value that describes the relative strength with which atoms of an element attract electrons in a chemical bond
* **polar covalent bond** – force that holds atoms together by unequally shared electrons
* **valence electrons** – electrons in the outermost energy level of an atom
 |
| Lesson 13: Macroscopic Patterns of Reactivity | * **electronegativity** – value that describes the relative strength with which atoms of an element attract electrons in a chemical bond
* **period** – row of the periodic table
* **reactivity** – tendency of an element to undergo a chemical reaction
* **valence electrons** – electrons in the outermost energy level of an atom
 |
| Lesson 14: Explaining Reactions | * **acid** – substance that releases hydrogen ions (H+) in solution
* **analyte** – solution whose concentration is determined by titration
* **aqueous solution** – solution using water as the solvent
* **balanced chemical equation** – model of a chemical reaction that shows the atoms of all reactants and products and the proportions in which they combine
* **base** – substance that releases hydroxide ions (OH–) in solution
* **concentration** – amount of a substance in a given amount of a mixture
* **indicator** – substance that provides a visible sign of the concentration of an ion
* **solution** – homogeneous mixture
* **titrant** – solution of known concentration used in titration to determine the concentration of another solution
* **titration** – process used to determine the concentration of a solution
 |
| Unit 7: Oxidation |
| Lesson 2: Oxidation Reduction Reaction Model | * **combination reaction**– a reaction in which reactants combine to form a compound
* **combustion reaction**– a redox reaction that occurs when a fuel reacts with an oxidant, usually oxygen gas, to produce a new product plus energy
* **covalent bond**– a bond formed when atoms *share* valence electrons
* **decomposition reaction**– a reaction in which a compound is broken down into its elements
* **electronegativity**– the ability of an atom to pull off electrons from another atom when forming a bond
* **ionic bond**– a bond formed by a transfer of electrons, thus creating ions held together by electrostatic forces
* **oxidation**– the loss of electrons in a redox reaction
* **oxidation-reduction reaction (redox reaction)**– a chemical reaction that involves an electron transfer between different atoms, molecules and/or ions
* **reduction**– the gain of electrons in a redox reaction
* **single displacement reaction**– a reaction in which an element replaces another element in a compound
* **valence electron**– an outer shell electron
 |
| Lesson 3: Oxidation Electron Transfer | * **anion**– negatively charged ion
* **anode**– the electrode at which oxidation occurs
* **battery**– a device that converts stored chemical energy into electrical energy on demand
* **cathode** – the electrode at which reduction occurs
* **covalent compound**– a chemical compound formed when two or more nonmetal atoms share valence electrons
* **electrode** – a terminal where electrical connections are made
* **galvanic cell (voltaic cell)**– an electrochemical cell in which spontaneous oxidation-reduction reactions produce electrical energy
* **half-cell** – half of a galvanic or voltaic cell, where either oxidation or reduction occurs
* **ion**– a charged particle
* **ionic compound**– a chemical compound composed of ions held together by electrostatic forces
* **oxidation**– the loss of electrons in a redox reaction
* **oxidation number (also called oxidation state)**– a number that represents an atom’s ability to acquire, donate, or share electrons; for some elements, this number may vary in different compounds
* **oxidation-reduction reaction (redox reaction)**– a chemical reaction that involves an electron transfer between different atoms, molecules and/or ions
* **reduction**– the gain of electrons in a redox reaction
 |
| Lesson 4: Oxidation Portfolio Day 1 | * **acid**– a substance that increases the concentration of hydrogen ions in a solution
* **electronegativity** – the ability of an atom to attract electrons to itself when forming a bond
* **oxidation** – occurs when an element loses electrons during a chemical reaction
* **oxidation number** – a number that represents the number of electrons lost or gained by an atom during a chemical reaction (also known as oxidation state)
* **oxidation-reduction reaction (redox reaction)**– a chemical reaction that involves a transfer of electrons between chemical species
* **redox reaction (oxidation–reduction reaction)** – a chemical reaction that involves a transfer of electrons between chemical species
* **reduction** – occurs when an element gains electrons during a chemical reaction
 |
| Lesson 5: Oxidation Portfolio Day 2 | * **oxidation**– occurs when an element loses electrons during a chemical reaction
* **oxidation number**– a number that represents the number of electrons lost or gained by an atom during a chemical reaction (also known as oxidation state)
* **oxidation–reduction reaction (redox reaction)**– a chemical reaction that involves a transfer of electrons between chemical species
* **precipitate**– a solid that forms when a chemical reaction occurs in a solution
* **reduction**– occurs when an element gains electrons during a chemical reaction
 |
| Lesson 6: Oxidation Portfolio Day 3 | * **ionic compound**– a compound made up of ions held together by electrostatic attractions
* **oxidation**– occurs when an element loses electrons during a chemical reaction
* **oxidation number**– a number that represents the number of electrons lost or gained by an atom during a chemical reaction (also known as oxidation state)
* **oxidation–reduction reaction (redox reaction)**– a chemical reaction that involves a transfer of electrons between chemical species
* **reduction**– occurs when an element gains electrons during a chemical reaction
* **valence electron**– electron in the highest occupied energy level of an atom
 |
| Unit 8: Particulate Electrical Forces |
| Lesson 2: Electrical Bonding Investigation | * **boiling point** – the temperature at which a liquid becomes a gas
* **Coulomb’s law** – the force between two point charges is proportional to the product of the charges and inversely proportional to the square of the distance between them
* **electrostatic force** – the attractive or repulsive force between two electrical charges
* **heat energy** – energy transferred between materials of different temperatures
* **melting point** – the temperature at which a solid becomes a liquid
* **surface tension** – a property of a liquid that results in a resistance of the surface of the liquid to rupture
* **vapor pressure** – the pressure a vapor exerts on the surface of a solid or liquid state of the same substance in a closed system
 |
| Lesson 3: Electrical Bonding Investigation Plan | * **boiling point** – the temperature at which a liquid becomes a gas
* **bulk properties** – properties of a substance that are not dependent on the amount of substance
* **electrostatic force** – also called electrical force; the attraction or repulsion between charged particles
 |
| Lesson 4: Electrical Bonding Investigation Data | * **dipole** – a molecule or bond in which there is a separation of charges due to unequal sharing of electrons in chemical bonds
* **hydrogen bond** – an electrostatic force between an electropositive hydrogen atom in one molecule and an electronegative atom in another molecule
 |
| Lesson 5: Electrical Bonding Investigation Evidence | * **boiling point** – temperature at which a substance changes state from a liquid to a gas
* **temperature** – a measure of the average kinetic energy of the particles of a substance
* **trial**– one of a number of attempts of a repeated procedure
 |
| Lesson 6: Electrical Bonding Particle Spacing | * **boiling point** – the temperature at which a substance changes phase from liquid to gas
* **heat energy** – energy transferred between substances or objects at different temperatures; also called thermal energy
* **intermolecular forces** – attractions between molecules
* **intramolecular forces** – attractions between atoms within a molecule
* **melting point** – the temperature at which a substance changes phase from solid to liquid
* **molecule** – a combination of atoms bonded together
 |
| Lesson 7: Electrical Bonding and Kinetic Energy | * **electrostatic forces** – forces resulting from electric charges; like charges repel, and opposite charges attract
* **kinetic energy** – energy associated with the motion of an object
* **temperature** – a measure of the average kinetic energy per particle in a substance
* **thermal energy** – internal energy within a system associated with the motion of particles in the system
 |
| Lesson 8: Electrical Bonding Molecular Level | * **electric forces** – forces resulting from electric charges; like charges repel, and opposite charges attract
* **melting point** – the temperature at which a substance changes phase from solid to liquid
* **temperature** – a measure of the average kinetic energy of the particles in a substance
* **thermal energy** – energy associated with the motion of the particles in a substance; also called heat energy
 |
| Lesson 9: Electrical Bonding: Multiple Scales | * **covalent bonds** – bonds resulting from the sharing of electrons between atoms
* **ionic bonds** – bonds resulting from electrostatic attraction between oppositely charged ions
* **melting point** – the temperature at which a particular substance changes phase from solid to liquid
 |
| Lesson 10: Electrical Bonding Investigation: Refining | * **data** – measurements taken and recorded during an experiment
* **experiment** – a scientific procedure designed to test a hypothesis
* **scientific method** – a procedure to obtain knowledge through the process of hypothesizing, experimenting, and analyzing results
 |
| Lesson 11: Electrical Forces Portfolio Day 1 | * **boiling point** – the temperature at which a substance boils, measured with a thermometer, while it undergoes a phase change from a liquid to a gas
* **bulk properties** – properties of a substance that measure the same no matter how large a sample you have of that substance. These include boiling point, melting point, vapor pressure, surface tension, and viscosity.
* **electrical force** – the force felt between charged particles; like charges repel and opposite charges attract
* **melting point** – the temperature at which a substance melts, measured with a thermometer, while it undergoes a phase change from a solid to a liquid
* **surface tension** – a measure of the strength of the bonds between molecules at the surface of a liquid, measured by determining how much mass the surface of the liquid can support before the object sinks
* **vapor pressure** – a measure of the pressure on the surface of a liquid due to evaporated molecules of the liquid, often measured by using a manometer (a device that measures the pressure of a fluid)
* **viscosity** – a measure of the thickness of a liquid or its resistance to flow, measured by determining flow rate or by timing how long it takes a small mass to fall through the liquid
 |
| Lesson 12: Electrical Forces Portfolio Day 2 | * **experimental error** – an error in an investigation that can limit precision and accuracy of results
* **human error** – an error in an investigation that is caused by an unintended human action
* **random error** – an error in an investigation that is determined by chance
* **systematic error** – an error in an investigation that is introduced by an inaccuracy (as of observation or measurement) inherent in the system
 |
| Lesson 13: Electrical Forces Portfolio Day 3 | * **peer review** – process in which other professionals in the same field read a submitted paper and scrutinize the methods and conclusions to make sure they are consistent with the science
 |
| Unit 9: Chemistry A Semester Review and Exam |