

Name _____

Topic 1 - Atomic Concepts

atom	atomic number	atomic mass
electron	valence electrons	excited state
ground state	isotope	mass number
neutron	orbital	proton
shell	wave-mechanical model	quanta
spectra		

- _____ 1. The positively charged particle in the nucleus of an atom
- _____ 2. A specific amount of energy released from an electron as it falls from a higher energy state to a lower one.
- _____ 3. The negatively charged particle found outside the nucleus of an atom.
- _____ 4. The area or space of an atom where an electron of a particular energy state is most likely to be found.
- _____ 5. Atoms of an element whose nuclei have the same number of protons but different number of neutrons and hence different atomic masses.
- _____ 6. A neutral particle (no charge) in the nucleus of an atom.
- _____ 7. The sum of protons and neutrons in the nucleus, used interchangeably with atomic mass.
- _____ 8. A relative mass scale with a basic unit of 1/12th the mass of a Carbon-12 atom, used interchangeably with mass number.
- _____ 9. The number of protons in the nucleus of an atom.
- _____ 10. The state of an atom when an electron moves to a higher energy state.
- _____ 11. The model of the atom that states the areas in which electrons are most likely located are called orbitals. (Also known as the "Electron cloud model")
- _____ 12. Electrons located in the outermost principal energy level...
- _____ 13. Concentric levels above the nucleus in which electrons are found, according to the **Bohr** model of the atom.
- _____ 14. The dense, positively-charged core of an atom; contains most of the atom's mass.
- _____ 15. The series of lines of radiant (light) energy produced when electrons return from higher energy states to lower energy states.
- _____ 16. The smallest part of an element that has properties of that element.
- _____ 17. The state of an atom when electrons occupy the lowest available energy states.

Chemistry Review - Vocabulary

Topic 2 - Periodic Table

alkali metal	ionization energy	transition metal
alkaline earth metal	ionic radius	isotope
atomic mass	metal	mass number
atomic radius	noble gas	atomic number
metalloid	halogen	electronegativity
nonmetal	family	group
periodic law	period	

- _____ 1. An element of group 2.
- _____ 2. The total number of protons and neutrons in the nucleus of an atom.
- _____ 3. A vertical column on the periodic table.
- _____ 4. Half the distance between two adjacent atoms in a crystal or half the distance between nuclei of identical atoms bonded together.
- _____ 5. The number of protons in the nucleus of an atom.
- _____ 6. Element whose atoms will gain or share electrons in chemical reactions.
- _____ 7. A measure of attraction of a nucleus for a bonded electron.
- _____ 8. Atom of an element that has a specific number of protons and neutrons.
- _____ 9. An element that has both metallic and nonmetallic properties.
- _____ 10. The average mass of all the isotopes in a sample of an element.
- _____ 11. Horizontal row of the periodic table.
- _____ 12. An element of group 1
- _____ 13. The amount of energy needed to remove the most loosely held electron of an atom.
- _____ 14. A nonreactive element that is in group 18 on the periodic table.
- _____ 15. The distance from the nucleus to the outer energy level of an ion
- _____ 16. Element whose atoms lose electrons in chemical reactions to become positive ions.
- _____ 17. The properties of elements are periodic functions of their atomic numbers.
- _____ 18. An element of group 17.
- _____ 19. An element that will have multiple oxidation states when forming an ion

Chemistry Review - Vocabulary

Topic 3 - Moles, Stoichiometry and Math

formula	formula mass	percent mass	single replacement
chemical change	physical change	coefficient	subscript
gram formula mass	polyatomic ion	combustion	molarity
molecular formula	product	decomposition	percent error
molecule	diatomic molecule	mole	percent by volume
double replacement	percent composition	qualitative	synthesis
empirical formula	parts per million	quantitative	symbol
endothermic	exothermic		

- _____ 1. The composition of a compound of each element compared with the total mass of the compound
- _____ 2. The concentration of a substance in moles per liter of solution
- _____ 3. The number of atoms of carbon present in 12.000 grams of Carbon-12.
- _____ 4. The simplest integer ratio in which atoms combine to form a compound.
- _____ 5. An exothermic reaction between oxygen and a hydrocarbon producing heat.
- _____ 6. The ratio between the parts of solute per million parts of solution.
- _____ 7. A covalently bonded group of atoms that have a net electric charge.
- _____ 8. A chemical reaction in which a compound is broken down into simpler substances.
- _____ 9. A reaction in which the composition of a substance is changed.
- _____ 10. Information that can be either counted or measured.
- _____ 11. The actual ratio of the atoms in a molecule.
- _____ 12. A substance formed in a chemical equation, shown on the right of the arrow
- _____ 13. Number placed before a formula indicating the number of units of the substance
- _____ 14. The concentration of a solution expressed as the ratio between the mass of the solute and the total mass of the solution, expressed as a percent.
- _____ 15. A molecule containing two identical atoms.
- _____ 16. A chemical reaction that absorbs heat, products have more PE than reactants
- _____ 17. The concentration of a solution expressed as the ratio between the volume of a solute and the total volume of the solution, expressed as a percent.
- _____ 18. A change that does not alter the chemical properties of a substance.

Chemistry Review - Vocabulary

- _____ 19. Symbols and subscripts used to represent the composition of a substance.
- _____ 20. The sum of the atomic masses of all atoms present.
- _____ 21. A chemical reaction that releases heat, products have less PE than reactants
- _____ 22. Chemical reaction in which a compound is broken down into simpler substances
- _____ 23. A reaction in which an element replaces a less reactive element in a compound
- _____ 24. The smallest unit of a covalently bonded substance that has the properties of that substance.
- _____ 25. A chemical reaction in which ions exchange places
- _____ 26. Information that cannot be counted or measured, a description
- _____ 27. Actual error divided by the accepted value X 100%
- _____ 28. A one, two or three letter designation of an element.
- _____ 29. The number written after a chemical symbol in a formula indicating the number of atoms present
- _____ 30. The formula mass expressed in grams instead of atomic mass units.
- _____ 31. A reaction in which two or more substances combine to form one product.

Topic 4 - Bonding

alloy	ionic bond	polarity
asymmetric molecule	Lewis dot diagram	polar covalent bond
covalent bond	malleability	polyatomic ions
double covalent bond	metallic bond	symmetric molecule
electronegativity	multiple covalent bond	triple covalent bond
formula	hydrogen bond	octet
ion	nonpolar covalent bond	valence electrons
ionization energy	octet rule	

- _____ 1. Molecules that have an asymmetric distribution of charge
- _____ 2. A bond formed by the equal sharing of a pair of electrons between two nuclei.
- _____ 3. A charged particle formed by either loss or gain of electrons
- _____ 4. Symbols and subscripts used to represent the composition of a substance
- _____ 5. The property of metals that allows them to be hammered into shapes
- _____ 6. A bond formed by the transfer of electrons from one atom to another.
- _____ 7. Positive metal ions immersed in a sea of mobile valence electrons.
- _____ 8. A homogeneous mixture of metal with another element, usually another metal.
- _____ 9. A molecule that lacks identical atomic structure on each side of an axis.
- _____ 10. A double or triple covalent bond.
- _____ 11. The attraction of a hydrogen atom in one molecule for an oxygen, nitrogen, or fluorine atom in another molecule.
- _____ 12. A maximum stable electron configuration must have no more than eight valence electrons.
- _____ 13. The stable valence electron configuration of eight electrons.
- _____ 14. A diagram that depicts valence electrons around the atomic symbol.
- _____ 15. A measure of the attraction of a nucleus for a bonded electron.
- _____ 16. The electrons in the outer energy level of an atom.
- _____ 17. The sharing of two pairs of electrons between two nuclei.
- _____ 18. A molecule with identical atomic structure on each side of an axis.
- _____ 19. A bond formed by the sharing of electrons between nuclei.
- _____ 20. A bond formed by the sharing of electrons between two nuclei.
- _____ 21. The sharing of three pairs of electrons between two nuclei.
- _____ 22. A covalently bonded group of atoms that have a net electric charge.
- _____ 23. Amount of energy needed to remove the most loosely held electron in an atom

Chemistry Review - Vocabulary

Topic 5 - Physical Behavior of Matter

condensation	liquid phase	heat of vaporization	homogeneous mixture	chemical change
deposition	saturated	kinetic molecular theory	heterogeneous mixture	freezing point
freezing	solid phase	parts per million (p.p.m.)	element	insoluble
unsaturated	vapor pressure	supersaturated	compound	specific heat capacity
fusion	sublimation	percent by volume	molecule	evaporation
gas phase	temperature	percent mass	atom	joules
heat	vaporization	solute	dilute	physical change
heat of fusion	boiling point	vapor	exothermic	pure substance
STP	solvent	heat of fusion	endothermic	ideal gas
calorimetry	matter			

- _____ 1. A process that absorbs heat energy, producing products with more potential energy than the reactants.
- _____ 2. The process in which a gas changes directly into a solid; reverse of sublimation
- _____ 3. A mixture in which the substances are not uniformly mixed
- _____ 4. The constant temperature endothermic process in which particles in the solid phase gain enough energy to break away into the liquid phase; also known as melting or the reverse of the freezing process.
- _____ 5. The temperature at which both the solid and the liquid phases of a substance exist in equilibrium; the same temperature as a substance's melting point.
- _____ 6. Energy transferred from one substance to another, it's symbol is Q
- _____ 7. Substances that cannot be broken down or decomposed into simpler substances by chemical means.
- _____ 8. An exothermic process in which vapor or a gas changes into the liquid phase; the PE of the substance decreases during this constant temperature process; the reverse of vaporization.
- _____ 9. A reaction in which the composition of a substance is changed
- _____ 10. The temperature at which the vapor pressure of a liquid is equal to the atmospheric pressure; the temperature at which a substance vaporizes
- _____ 11. The smallest particle of an element that can enter into a chemical reaction.
- _____ 12. A substance composed of two or more elements that are chemically combined in definite proportions by mass.
- _____ 13. The process by which molecules in the liquid phase escape into the gaseous phase.
- _____ 14. A process that releases heat; producing less PE than the reactants
- _____ 15. A phase of matter without definite shape or volume
- _____ 16. The amount of heat needed to convert a unit mass of a substance from a liquid to a vapor at its boiling point. Its symbol is "H_v"

Chemistry Review - Vocabulary

- _____ 17. A substance in which the particles are uniformly mixed.
- _____ 18. A material with low solubility; it's difficult to dissolve
- _____ 19. A theory used to explain the behavior of gases in terms of motion of particles
- _____ 20. A phase of matter having definite volume but no definite shape. (takes the shape, but not volume, of the container).
- _____ 21. The smallest unit of a covalently bonded substance that has properties of that substance.
- _____ 22. Anything that has mass or volume.
- _____ 23. The ratio between the parts of solute per million parts of solution
- _____ 24. The concentration of a solution expressed as the ratio between the volume of a solute and the total volume of solution, expressed as a percent
- _____ 25. The concentration of a solution expressed as the ratio between the mass of a solute and the total mass of solution, expressed as a percent
- _____ 26. A unit of heat energy
- _____ 27. A change that does not alter the chemical properties of a substance
- _____ 28. A solution containing the maximum amount of solute that will dissolve
- _____ 29. A compound or an element
- _____ 30. A measure of how much solute will dissolved in a certain amount of solvent
- _____ 31. The process by which a solid changes directly into a gas
- _____ 32. A solution that contains more solute than would dissolve in a saturated solution
- _____ 33. The pressure exerted by a vapor
- _____ 34. The constant temperature process in which particles in the liquid phase gain enough energy to break away into the gaseous phase; also known as boiling or reverse of condensation process
- _____ 35. A homogeneous mixture of substances in the same physical state; in which one substance is dissolved in another
- _____ 36. The substance that is dissolved
- _____ 37. The substance that dissolves another
- _____ 38. A solution in which more solute can be dissolved
- _____ 39. The amount of heat needed to convert a mass of a substance from a solid to a liquid at its melting point; Its symbol is "H_f"
- _____ 40. Heat needed to raise temperature of one gram of a substance 1°C; Symbol "C"
- _____ 41. The measure of average kinetic energy of a substances particles
- _____ 42. A phase of matter having definite shape and volume, particles have crystalline arrangement
- _____ 43. 273 K and 1 atm (or 101.3 kPa)
- _____ 44. A method of measuring the amount of heat released or absorbed during a process by relating to the temperature change in water
- _____ 45. A solution that is very unsaturated
- _____ 46. The gaseous state of a substance that is normally a liquid at room temperature
- _____ 47. A theoretical gas which occupies no volume and has no particle attractions

Chemistry Review - Vocabulary

Topic 6 - Kinetics and Equilibrium

activated complex	activation energy	equilibrium	catalyst	ΔS
LeChateliers Principle	collision theory	temperature	entropy	endothermic
PE Diagram	spontaneous reaction	concentration	stress	exothermic
nature of reactants	surface area	heat of reaction	ΔH	

- _____ 1. Abbreviation for change in entropy
- _____ 2. Condition of a reversible reaction in which the rate of the forward equals the rate of the reverse reaction and concentrations of products and reactants are constant
- _____ 3. A reaction in which the energy of the products is greater than the energy of the reactants
- _____ 4. Changing this can affect the rate of a chemical reaction by changing how much of the products and reactants are present
- _____ 5. The temporary, intermediate product in a chemical reaction. It has the most amount of energy in the reaction.
- _____ 6. Molecule that increases the rate of reaction by decreasing the activation energy
- _____ 7. A diagram showing the changes in potential energy as a reaction proceeds
- _____ 8. Changes in this affect the rate of reaction by controlling how much of the reactants come in contact with each other.
- _____ 9. A measure of disorder or randomness in a system.
- _____ 10. The amount of energy needed to form an activated complex from reactants
- _____ 11. A term for the type of molecules involved in a chemical reaction. Organic molecules tend to have slower reaction times.
- _____ 12. Reactions that tend toward lower energy and higher entropy
- _____ 13. Reactants in a chemical reaction must collide with proper orientation and energy
- _____ 14. Any change in concentration, temperature, or pressure in a system at equilibrium
- _____ 15. Controls the rate of a chemical reaction by controlling the speed of the particles
- _____ 16. When a system at equilibrium is under stress, the system will shift in the direction that will relieve the stress.
- _____ 17. Equal to the heat of the products minus the heat of reactants ($PE_p - PE_r$)
- _____ 18. A symbol for heat of reaction

Chemistry Review - Vocabulary

19. A reaction in which the heat of the reactants is greater than the heat of the products

Topic 7 - Organic Chemistry

isomer	alkene	ketone	addition reaction	amino acid	polymerization	saturated
alcohol	alkyne	polymer	fermentation	organic acid	substitution reaction	
aldehyde	amide	ester	functional group	organic halide	saponification	
alkane	amine	ether	hydrocarbon	esterification	unsaturated	

1. An organic reaction in which ethanol and CO₂ are produced from a carbohydrate
2. One or more hydrogen atoms is removed from a saturated hydrocarbon and replaced by another atom
3. The product obtained from the reaction of an organic acid with an amine.
4. The atom or atoms that replace a hydrogen atom in a hydrocarbon and give a class of organic compounds characteristic properties.
5. Organic compounds made up of chains of smaller units bonded together
6. Organic compound containing only hydrogen and carbon atoms
7. Organic compounds containing only single covalent bonds
8. One of a homologous series of saturated hydrocarbons
9. One of a homologous series of hydrocarbons that contain one double bond
10. One of a homologous series of hydrocarbons that contain one triple bond
11. An organic compound containing one or more double or triple covalent bonds
12. The reaction with an alkali and a fat to produce glycerol and a **soap**.
13. An organic compound in which the carbonyl (-C=O) group is at the end of a carbon chain
14. The organic product of an esterification reaction containing -COOC- as the functional group
15. Organic compound where the oxygen is bonded to two carbon atoms (R₁-O-R₂)
16. An organic compound containing a hydroxyl (-O-H) as the functional group
17. Chemical reaction between alcohol and an acid to produce an ester and water
18. An organic compound containing both the amine group (-NH₂) and the carboxylic group (-COOH)
19. Organic compound where the carbonyl (C=O) group is in the middle of the chain
20. Compounds with the same molecular formula but different structural formula
21. An organic compound containing one or more carboxyl groups (-COOH)
22. An ammonia derivative in which one or more of the hydrogens are replaced by an alkyl group
23. Organic reaction where many small units are joined together to form a long chain

Chemistry Review - Vocabulary

- _____ 24. An organic compound in which one or more hydrogen atoms have been replaced by an atom of a halogen; also known as a halocarbon
- _____ 25. An organic reaction in which a substance such as hydrogen or a halogen is added to the site of a double or triple bond.

Topic 8 - Oxidation and Reduction

anode	cathode	corrosion	electroplating	electrochemical cell	oxidation number (state)
electrode	reduction	salt bridge	electrolytic cell	reducing agent	
oxidation	redox	electrolysis	half-reaction	oxidizing agent	

- _____ 1. A reaction that shows either oxidation or reduction portion of a redox reaction
- _____ 2. A cell that requires electricity to cause a non-spontaneous redox reaction to occur
- _____ 3. The site in an electrochemical cell where oxidation occurs
- _____ 4. A part of a voltaic cell that connects two containers and allows the flow of ions
- _____ 5. The site at which oxidation or reduction occurs; an anode or a cathode
- _____ 6. Number assigned to keep track of electron gain or loss in redox reactions
- _____ 7. The process of layering a metal onto a surface using an electrolytic cell
- _____ 8. An abbreviation for an oxidation-reduction reaction
- _____ 9. The site in an electrochemical cell where reduction occurs
- _____ 10. The depletion of a metal due to oxidation and reduction
- _____ 11. The gain of electrons and the loss of oxidation number
- _____ 12. The substance reduced in a redox reaction
- _____ 13. An electrochemical cell in which a spontaneous chemical reaction causes a flow of electrons
- _____ 14. A process in which an electric current forces a non-spontaneous redox reaction to occur
- _____ 15. The substance oxidized in a redox reaction.
- _____ 16. A system in which there is an electric current flowing while a chemical reaction occurs
- _____ 17. The loss of electrons and an increase in oxidation state.

acidity	indicator	titration	hydroxide ion	Alternative Theory Acid
salt	electrolyte	neutralization	Arrhenius acid	Alternative Theory Base
pH scale	alkalinity	hydronium ion	Arrhenius base	hydrogen ion

- _____ 1. A substance that produces hydrogen (hydronium) ions as the only positive ions when dissolved in water.
- _____ 2. A substance that behaves as a hydrogen ion (proton) acceptor
- _____ 3. A substance that undergoes a color change that can be used to determine when a reaction is complete
- _____ 4. A measure of the hydroxide concentration of a solution
- _____ 5. A substance that behaves as a hydrogen ion (proton) donor
- _____ 6. A substance that produces hydroxide ions as the only negative ions when dissolved in water
- _____ 7. A measure of the hydrogen (hydronium) ion concentration of a solution
- _____ 8. The process of determining the concentration of an unknown solution by a reaction with a known concentration
- _____ 9. The product (other than water) of a neutralization reaction; an ionic substance consisting of a metallic cation and anion other than hydroxide ion
- _____ 10. A hydrogen atom without its electron (consisting solely of a proton)
- _____ 11. A logarithmic scale that measures the acidity or alkalinity of a solution on a scale of 1 to 14
- _____ 12. OH^-
- _____ 13. A substance whose water solution conducts an electric current
- _____ 14. H_3O^+ formed by the combination of water with a hydrogen ion
- _____ 15. The reaction between an acid and a base to produce water and a salt

Chemistry Review - Vocabulary

Topic 10 - Nuclear Chemistry

alpha particle	gamma ray	radioisotope
beta particle	half-life	natural transmutation
fission	tracer	artificial transmutation
fusion		

- _____ 1. A transmutation caused by bombarding a nucleus with a high-energy particle, such as a neutron or an alpha particle
- _____ 2. The length of time for half of a given sample of a radioisotope to decay
- _____ 3. A high-energy electron
- _____ 4. An unstable nucleus that is radioactive
- _____ 5. Splitting of a large nuclei into middle-weight nuclei and neutrons
- _____ 6. The changing of a nucleus of one element into that of a different element as a result of natural radioactivity
- _____ 7. The combining of light nuclei into a heavier nucleus
- _____ 8. A radioisotope use to track a chemical reaction
- _____ 9. High-energy ray similar to an x-ray
- _____ 10. A helium nucleus