



CHEMISTRY SAGE PREP CHECKLIST

“We’ve Covered a lot of Chemistry” Review Materials

1. Use this sheet to keep track of the following videos and activities.
2. Once you have completed them, put a checkmark by it.
3. When you complete them all, sign your name and have your parent/Learning Coach sign it as well.
4. Then, bring this document with you to your Testing Site for a reward!
5. Submit a copy to Mrs. Finlinson through Kmail for Extra Credit points.

Student Name _____ Student Signature _____

Parent/LC Signature _____

1. THE PERIODIC TABLE AND CHANGES OF MATTER

Origin and Distribution of Elements: Watch this video: <http://viewpure.com/aYIDLWskRH0>

*The two most abundant elements in the universe are _____ and _____.

(go to following website to answer above question – scroll to second page
https://en.wikipedia.org/wiki/Abundance_of_the_chemical_elements)

Atomic Theory –

a.) Matter is made of tiny particles called _____

b) Atoms are _____. During a chemical reaction, atoms are rearranged, but they do not break apart, nor are they created or destroyed.

c) All atoms of a given element are _____ in mass and other properties.

d) The atoms of different elements differ in _____ and other properties

e) Atoms of one element can combine with atoms of another element to form “compounds” – new complex particle

What is an atom: <https://www.youtube.com/watch?v=o-3I1JGW-Ck>

History of the Atom watch this video(TED Ed):

<https://www.youtube.com/watch?v=xazQRcSCRaY>

Different video: <http://viewpure.com/QbWKF9uDF7w?start=0&end=0>

Periodic Table:

Watch this video: <http://viewpure.com/xpOwkQZOOd8?start=0&end=0>

Build an atom simulator: <https://phet.colorado.edu/en/simulation/build-an-atom>

Play this jeopardy game (**Optional**): <https://www.quia.com/cb/36842.html>

Moles:

The Mole- go to: <http://bit.ly/1cEa4pR>

What is Avogadro's number?

-What does Avogadro's number tell us?

The mole is a unit song: <https://www.youtube.com/watch?v=m-oDiYNyaSU>

2. QUANTUM ENERGY AND NUCLEAR ENERGY

Wavelengths: For a video introduction to the electromagnetic spectrum, go to this URL:

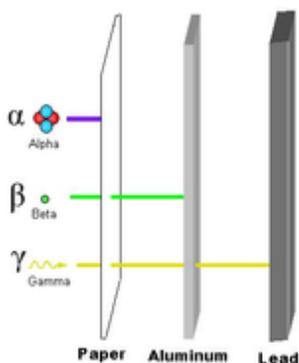
<http://bit.ly/1gyLjPE>

On the electromagnetic spectrum, there are Radio Waves, IR, Visible, UV rays, X- rays and Gamma rays. Out of the different types of waves:

- Which ones have shorter wavelengths have higher frequencies and more energy?
- Which ones longer wavelengths have lower frequencies and less energy?

Alpha, Beta and Gamma radiation and particles – Study the following pictures about radioactive particles.

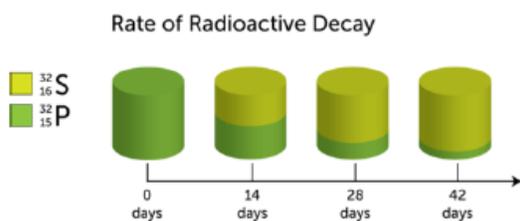
Visit this website: <http://www.pbs.org/wgbh/nova/dirtybomb/sour-flash.html>



Particle	Symbol	Mass	Penetrating Power	Ionizing Power	Shielding
Alpha	α	4 amu	Very Low	Very High	Paper, Skin
Beta	β	1/2000 amu	Intermediate	Intermediate	Aluminum
Gamma	γ	0 (energy only)	Very High	Very Low	2 inches lead

Half life: Rate of Radioactive Decay

Over time, as the nuclei continue to decay, less and less of the original radioisotope remains. A radioisotope decays and changes to a different element at a constant rate. The rate is measured in a unit called the **half-life**. This is the length of time it takes for half of a given amount of the radioisotope to decay. This rate is always the same for a given radioisotope, regardless of temperature, pressure, or other conditions outside the nuclei of its atoms.



3. BONDING

Chemical/physical properties and Chemical/physical changes:

<http://www.mrwiggersci.com/chem/Tutorials/Ch3-Rev-Pract-Chem-Phys-Prop-Chg-Blacksburg.htm>

Valence Electrons: Read the following

Valence electrons are the electrons in the outer energy level of an atom that can participate in interactions with other atoms.

Because valence electrons are so important, atoms may be represented by electron dot diagrams that show only their valence electrons.

The number of valence electrons in atoms may cause them to be unreactive or highly reactive. Valence electrons will determine the bond type.

Ions: <http://viewpure.com/CV53wfl-oV8?start=0&end=0>

Ions activity: http://www.pbslearningmedia.org/asset/lps07_int_ionicbonding/

Bonds (remember the Dogs?) http://viewpure.com/_M9khs87xQ8

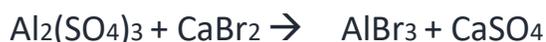
Water: A polar Molecule: <http://www.bozemanscience.com/water-a-polar-molecule>

Ionic Formulas Game: http://www.learner.org/interactives/periodic/groups_interactive.html

London Dispersion Forces: <http://www.bozemanscience.com/ap-chem-016-london-dispersion-forces>

4. LAW OF CONSERVATION OF MASS

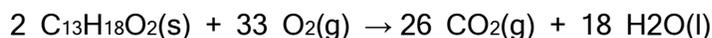
- Balancing Chemical Reactions:** Balance the following chemical equation. List the reactants. List the products:



- Law of Conservation of Mass:**

Ibuprofen is a common painkiller used by many people around the globe. It has the formula $\text{C}_{13}\text{H}_{18}\text{O}_2(\text{s})$. If 200. g of Ibuprofen is combusted, how much carbon dioxide is produced?

Step 1: Write and balance the equation: (I gave you the balanced equation)

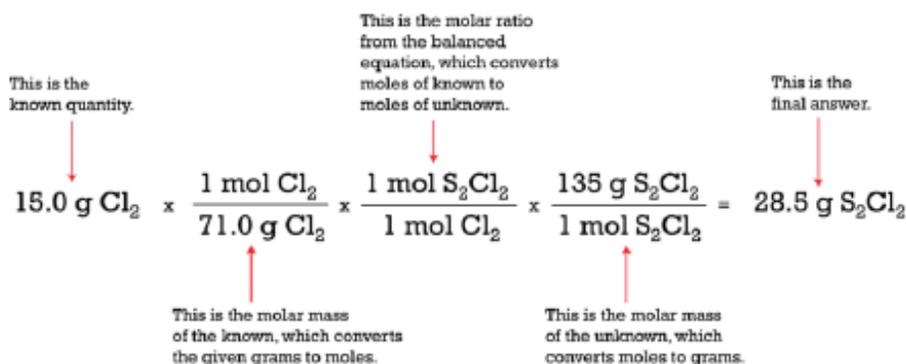


Step 2: Determine what is given and what needs to be calculated:

Given:

What needs to be calculated:

Step 3: Set-up the conversion system (start with given, end with what you are trying to find - see example below)



- Law of Conservation of Energy (Endothermic, Exothermic)**

Which of the following processes would be endothermic?

- a. natural gas burning b. melting chocolate
c. fireworks exploding d. Steam condensing

Which of the following processes would be exothermic?

- a. gasoline burning b. evaporation of ether
c. melting butter d. boiling water

Voltaic Cells: Activity

<http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/electroChem/voltaicCell20.html>

5. RATES OF REACTION

Collision Theory: Read the following

- The particles must collide with each other
- The particles must have proper orientation
- The particles must collide with sufficient energy to break the old bonds

5 factors that affect the rates of reaction: <http://safeshare.tv/w/dnavmRAyOe>

Le Chatelier's Principle: <http://www.harpercollege.edu/tm-ps/chm/100/dgodambe/thedisk/equil/equil.htm>

Summary

- Irreversible reactions will continue to form products until the reactants are fully consumed.
- Reversible reactions will react until a state of equilibrium is reached.
- a reaction is at equilibrium when there is no net change to the system over time.
- Dynamic equilibrium refers to an equilibrium where forward and reverse reactions are still occurring, but they are proceeding at the same rate, so there is no net change.
- increasing the concentration of a reactant causes the equilibrium to shift to the right, producing more products.
- increasing the concentration of a product causes the equilibrium to shift to the left, producing more reactants.
- decreasing the concentration of a reactant causes the equilibrium to shift to the left, using up some products.
- decreasing the concentration of a product causes the equilibrium to shift to the right, using up some reactants.
- changing the temperature of a reaction system will cause a shift in equilibrium based on the ΔH of the reaction. Heating an endothermic reaction causes a shift toward the products. Heating an exothermic reaction causes a shift toward the reactants.

6. CONCENTRATION

Solubility: What three factors affect solubility?

Molarity: <http://www.sciencegeek.net/Chemistry/Video/SolnConc3.mp4>

Molality: <http://viewpure.com/4rhfHkMT6mE?start=0&end=0>

Acids/Bases and pH: <http://www.bozemanscience.com/acids-bases-ph>

Colligative Properties:

<http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/propOfSoln/colligative.html>

Colligative Properties Summary

- Colligative properties are properties that are due only to the number of particles in solution and not to the chemical properties of the solute.

- Vapor pressure lowering, boiling point elevation, and freezing point depression are colligative properties.
- For electrolyte solutions, the van't Hoff factor is added to account for the number of ions that the solute will dissociate into in solution.