Formula mass and Percent (%) Composition

41. Formula mass, molar mass, and percentage composition can be calculated from the chemical formula for a compound.

42. Define the following:

Formula mass:

Percentage composition:

43. (pg. 232 in textbook) The empirical formula of a compound of phosphorous and oxygen was found to be P_2O_5. The molar mass of this compound is 283.89 g/mol. What is the compound's molecular formula?
SHOW WORK!

44. (pg. 227 in textbook) Find the percentage composition of copper (I) sulfide, Cu_2S. *SHOW WORK!*

Properties and Lab Equipment/Measurements

1. Know the difference between physical/chemical properties.
   Put a c (chemical) or p (physical) by the items in which a physical or chemical property may be investigated by:

Souring of milk	Freezing Water
Cutting Paper	Tarnishing of silver
Burning wood	Melting of Wax

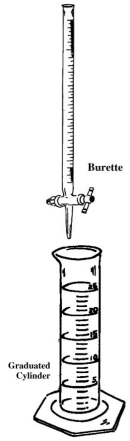
2. Density is an intensive property which does not depend on the amount of matter present. If you cut an object in half, the density doesn't change. List 2 more examples of an intensive property.

_____ _____

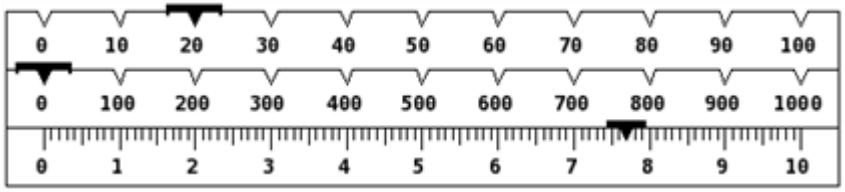
3. Volume is an extensive property as it does depend on the amount of matter that is present. List 2 more examples of an intensive property.

_____ _____

4. Equipment: Use:



5. How much mass is shown?



Atomic Theory and Periodic Trends

6. The electron was discovered by using experiments with _____ rays in the late 1800s.

7. Who discovered the nucleus in 1911.

8. Circle the following that are TRUE regarding Dalton's Atomic Theory (1808).

A. All matter is composed of extremely small particles called atoms
B. Atoms cannot be subdivided , created or destroyed
C. Atoms of a given element are identical in size, mass, and other properties
D. In chemical reactions, atoms are combined, separated, or rearranged

9. In 1913 Niels Bohr proposed/developed _____

_____

_____

10. Define the following periodic trends.

- Ionization energy:
- Electron affinity:
- Electronegativity:

11. Watch! And READ LYRICS!

Type of Reactions and Redox Reactions

39. Define the following types of reactions:

A. Synthesis/Composition-

B. Decomposition-

C. Single-replacement-

D. Double-replacement-

E. Combustion-

F. Reduction-Oxidation (Redox)-

40. Match the Reaction with the correct letter from above.

_____ $3\ NaBr + 1\ H_3PO_4 \longrightarrow 1\ Na_3PO_4 + 3\ HBr$

_____ $3\ Mg + 1\ Fe_2O_3 \longrightarrow 2\ Fe + 3\ MgO$

_____ $1\ C_2H_4 + 3\ O_2 \longrightarrow 2\ CO_2 + 2\ H_2O$

_____ $2\ PbSO_4 \longrightarrow 2\ PbSO_3 + 1\ O_2$

$$\underset{+4}{CO_{2(g)}} + \underset{0}{H_{2(g)}} \rightleftharpoons \underset{+2}{CO_{(g)}} + \underset{+1}{H_2O_{(g)}}$$ _____

Reduction

Oxidation

Naming and Writing Formulas

34. Name the following *ionic* compounds:

NaBr _____

CaO _____

Li_2S _____

35. Write the formulas for the following *ionic* compounds:

potassium iodide _____

magnesium oxide _____

aluminum chloride _____

36. Write the names of the following *covalent* compounds:

SO_3 _____

N_2S _____

PH_3 _____

37. Write the formulas of the following *covalent* compounds:

nitrogen trichloride _____

boron carbide _____

dinitrogen trioxide _____

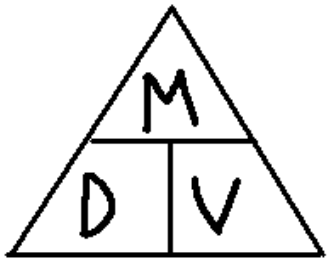
38. The law of conservation of mass states that matter is neither_____nor_____.

$2H_2 + O_2 \longrightarrow 2H_2O$

If you have 5g of H_2 and 2g of O_2, how many grams of H_2O should you have?

Density, Isotopes, and Calculating Avg. Atomic Mass

12. Density is defined as the _____ divided by the_____.



D= m/v

M= dv

V= m/d

D = density = g/cm3
M = mass = g
V = volume = cm3

13. What is the density of a sample of gold that weighs 43.25g with a volume of 2.5 cm^3?

14. Isotopes are atoms of the same element that have different _____. The masses of isotopes are different because they have a different number of _____

15. Define **Average atomic mass**: _____

_____

_____

16. Calculate the average atomic mass of magnesium using the following data for three magnesium isotopes.

Isotope	*mass (u)*	*relative abundance*
Mg-24	23.985	0.7870
Mg-25	24.986	0.1013
Mg-26	25.983	0.1117

Answer: _____amu

Electron Configurations and Electromagnetic Spectrum

17. S orbitals have a _____shape.

    P orbitals have a _____shape.

18. How many electrons (total) can each orbital hold?
    - s can hold_____ electrons
    - p can hold_____ electrons
    - d can hold_____ electrons
    - f can hold_____ electrons

18. The *superscripts in the electron configuration represent the number of electrons for an element*. Counting the electrons (superscripts) will give you the number of electrons. You can then determine what element is represented because the number of electrons = the number of electrons for a neutral atom.

19. What element is represented by the following electron

    configuration: $1s^2 2s^2 2p^1$

20. Define Wavelength:

    Define Frequency:

21. **c = λv** (speed of light = wavelength x frequency). Wavelength (λ) is measured in m and frequency (v) is measured in Hertz (1/sec). **E=hv** (Energy= plank's constant x frequency)

22. Violet light has a wavelength of 4.10×10^{-12} m. What is the frequency? *Hint: USE TRIANGLE*

23. Calculate the energy of a photon of radiation with a frequency of 8.5×10^{14} Hz. *Hint: USE TRAINGLE*

Lewis-dot Structures and VSEPR/ Molecular Geometry

24. A_____bond is formed when the atoms that share electrons have an unequal attraction for the electrons.

25. Define molecule

26. What is the octet rule?

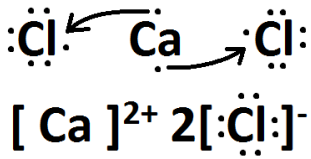
27. Valence electrons are needed to draw Lewis structures. Review the rules for drawing Lewis structures. Draw the Lewis structure for carbon tetrafluoride (CF_4).

28. What theory is used for predicting the shape of a molecule based on the repulsion of electrons?

29. In ionic compounds, ions minimize their potential energy by combining in an orderly arrangement known as a _____lattice. Each cation is surrounded by _____.

30. Know the geometries: *what shape will these compounds have?*
    - AB_2E
    - AB_3
    - AB_4

31. Subscripts in a formula indicate the number of _____of each element.

32. The element's charge must be known in order to form a compound (example Mg and Cl, $Mg^{+2}Cl^{1} = MgCl_2$). Review charges on page 205 and 210.

33. Ionic compounds are formed between a_____and a _____.