

Midterm Review Page 1

1. Circle those which are chemical changes  
decomposition of water      rusting of iron      melting of ice      evaporation of alcohol
2. Substances and solutions are \_\_\_\_\_ (homogeneous or heterogeneous)
3. Metals are on the left side of the Periodic Table with \_\_\_\_\_ being the exception.
4. Ten different 50-g masses are placed on an electronic scale, one at a time.  
Each time the scale reads 46.44 grams. The scale is \_\_\_\_\_ but not \_\_\_\_\_.
5. Express each answer with the correct number of significant figures.  
 $34.7864 \text{ g} + 2.84 \text{ g} = \underline{\hspace{2cm}}$  and then,  $(9.0\text{cm})(23\text{cm}) = \underline{\hspace{2cm}}$
6. Balance the equation \_\_\_\_\_Cr + \_\_\_\_\_O<sub>2</sub> ----> \_\_\_\_\_CrO<sub>3</sub>
7. Given the box at right, What is the number of electron, protons, and neutrons in the atom represented?

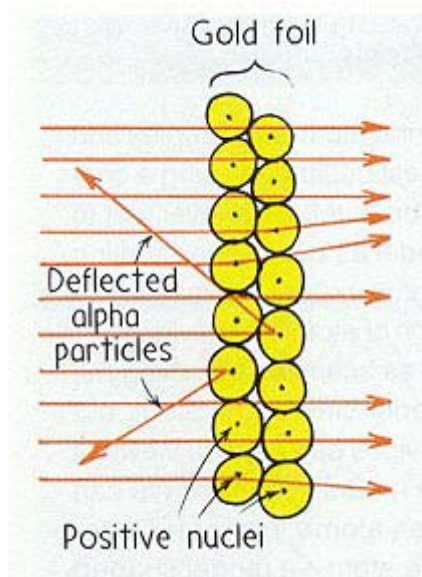
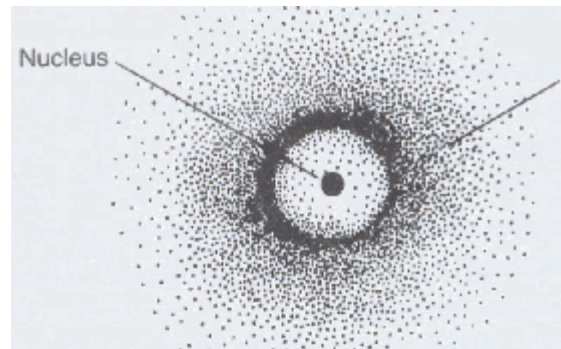
32
15 X
8. What element is represented by the X?
9. Which isotope is the standard reference point for the masses of atoms? \_\_\_\_\_
10. Calculate the average atomic mass of the element if 91.0% of the isotopes have a mass number of 20 amu, 8.00% of the isotopes have a mass number of 21 amu, and 1.00% of the isotopes have a mass number of 22 amu.
11. The molecular mass is the mass of one molecule measured in \_\_\_\_\_.
12. The molar mass is the mass of one mole measured in \_\_\_\_\_.
13. THERE IS NEVER A 13 in our class.
14. What is the molar mass of zinc nitrate? \_\_\_\_\_
15. What is the percent composition of the elements in potassium sulfate?
16. Which of the following are empirical formulas?  
H<sub>2</sub>O      CH<sub>4</sub>      NaCl      C<sub>2</sub>H<sub>6</sub>      C<sub>7</sub>H<sub>12</sub>      C<sub>2</sub>H<sub>5</sub>OH

Midterm Review Page 2

1. Which reaction will occur spontaneously?  
 $\text{MgBr}_{2(\text{AQ})} + \text{Fe}_{(\text{S})} \rightarrow ???$  or  $\text{CoCl}_{2(\text{AQ})} + \text{Al}_{(\text{S})} \rightarrow ???$
2. What is the charge on the perchlorate ion?
3. Which substance will boil at 90°C when the vapor pressure is 150 kPa? ethanoic acid or ethanol
4. Which element would have properties most similar to calcium? magnesium or potassium
5. Which isotope of carbon has 6 neutrons? carbon-12 or carbon-14
6. 2.0 moles of a noble gas at STP has a mass of 80 amu. Which noble gas is it?
7. Which ion has 27 electrons?  $\text{Cu}^{+2}$  or  $\text{Mn}^{+2}$
8. Which element would form an ionic compound with bromine? germanium or rubidium
9. How many valence electrons do the alkaline earth metals have? one or two
10. Which compound releases energy when it decomposes? aluminum oxide or nitrogen dioxide
11. Which compound has the same molar mass as ammonium thiocyanate?  
magnesium cyanide or lithium hydrogen carbonate
12. Which metal has the higher melting point? beryllium or lithium
13. guess again, nothing in this space but smiles
14. Which species has the same number of electrons as neon? chloride or sodium ion  
(species is not just in biology, it means which of these choices)
15. What is the mass number of the most common isotope of Al? 26.98154 amu or 27 amu
16. On which isotope are all relative atomic masses based? O-16 or C-12

[1]

What atomic model is best represented by the diagram at right?

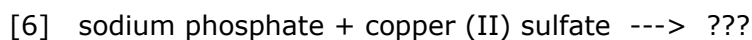
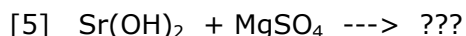


[2] What atomic model was developed after the experiment diagrammed at left was performed?

[3] If you pour two clear solutions together and you end up with a precipitate (as pictured at right) what sort of chemical reaction occurred?



What would be the precipitate in each of these 3 reactions?



Pieces of aluminum are added to a beaker of iron (II) chloride solution and allowed to sit for 15 minutes.

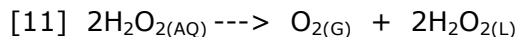
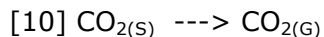
[7] When the contents of the beaker are poured into the funnel in the apparatus at right, what will remain in the filter paper?

[8] What will be in the Erlenmeyer flask?

[9] What would be in the flask if pieces of copper were added to the beaker containing an iron (II) chloride solution?



Label each of these as a chemical or a physical change:



[12] decomposition of water

[14] freezing of water

Give the name for each of these:

