

Assignment 1

Name _____



- The law of constant composition applies to _____.
 - Solids
 - Heterogenous mixtures
 - Compounds**
 - Homogenous mixtures
 - Solutions
 - Heterogenous mixture
- Osmium has a density of 22.6 g/cm^3 . What volume in (cm^3) would be occupied by a 21.8 g sample of osmium.
 - 493
 - 1.04
 - 0.965**
 - 2.03×10^3
 - 2.03×10^{-3}
- Which one of the following is not true concerning cathode rays?
 - The characteristics of cathode rays depend on the material from which they are emitted.**
 - They travel in straight lines in the absence of electric or magnetic fields.
 - They are made up of electrons.
 - They impart a negative charge to metals exposed to them.
 - They originate from the negative electrode.
- Which atom has the largest number of neutrons?
 - phosphorus-30
 - potassium-39
 - argon-40**
 - chlorine-37
 - calcium-40
- Which of the following molecular formulas is also an empirical formula?
 - C_6H_6
 - H_2O_2
 - $\text{C}_6\text{H}_6\text{O}_2$
 - $\text{C}_2\text{H}_2\text{SO}$**
 - $\text{H}_2\text{P}_4\text{O}_6$
- What is the mass % of carbon in dimethylsulfoxide ($\text{C}_2\text{H}_6\text{SO}$) rounded to three significant figures?
 - 60.0
 - 7.74
 - 30.7**
 - 20.6
 - 79.8

7. Acceleration due to gravity of a free-falling object is 9.8 m/s^2 . Express this in millimeters/millisecond².



8. Name/give the formula for the following compounds:

a. $\text{Fe}_3(\text{PO}_4)_2$



b. TiO_2



c. chromium (II) sulfate



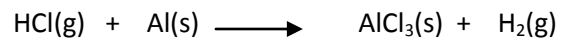
d. P_4O_6



9. The percent composition of acetic acid is 39.9% C, 6.7% H and 53.4% O. Determine the empirical formula. The molecular weight of acetic acid was determined to by experiment to be 60.0 amu. What is the molecular formula?



10. Aluminum chloride is used as a catalyst in various industrial reactions. It is prepared from hydrogen chloride gas and solid aluminum metal shavings. Hydrogen gas is the other product.



Suppose a reaction vessel contains 13.82 grams of Al (s) and 27.9g of HCl(g). How many grams of AlCl₃ can be prepared from this mixture?

