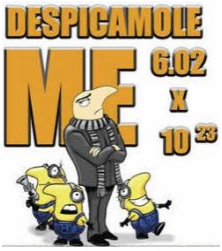
Good Luck to _____ Mr. Bisteau

Block _____ *Practice Assessment* of **UNIT 7** - *Chemical Quantities*



On the Scantron form color the letter of the term or phrase that correctly completes the statement or answers the question. (2 pts each)

_____ 1. All of the following are equal to Avogadro's number EXCEPT _____.

A. the number of molecules of nitrogen in 1 mol N_2
B. the number of atoms of gold in 1 mol Au
C. the number of formula units of sodium phosphate in 1 mol Na_3PO_4
D. the number of atoms of bromine in 1 mol Br_2
E. the number of molecules of carbon monoxide in 1 mol CO

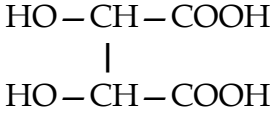
_____ 2. You have two beakers on your lab table. Beaker #1 contains 32.066 g of sulfur and Beaker #2 contains 74.9216 g of arsenic (As). Which beaker contains the greatest number of atoms? Choose the best answer.

A. Beaker #1 because one sulfur atom weighs less than one arsenic atom so you need more of the sulfur atoms to fill the beaker.
B. Beaker #1 because it contains more moles of sulfur atoms than the number of moles of arsenic atoms in Beaker #2.
C. Beaker #2 because arsenic has a greater mass than sulfur.
D. Beaker #2 because it contains more moles of arsenic atoms than the number of moles of sulfur atoms in Beaker #1.
E. Beakers #1 and #2 contain the same number of atoms because there is one mole in each.

_____ 3. Which of the following is NOT a true statement concerning empirical and molecular formulas?

1. The molecular formula of a compound can be the same as its empirical formula.
2. The molecular formula of a compound can be some whole-number multiple of its empirical formula.
3. Several compounds can have the same empirical formula, but have different molecular formulas.
4. The empirical formula of a compound can be triple its molecular formula.
5. If the molecular formula of hydrogen peroxide is H_2O_2, its empirical formula is HO.

_____ 4. Based on the structural formula below, what is the **empirical formula** for tartaric acid, a compound found in grape juice?



A. CHO B. $C_2H_3O_3$ C. $C_4H_6O_6$ D. $CH_{1.5}O_{1.5}$

_____ 5. The molar mass of ammonium dichromate is

A. 250.03 g/mol B. 234.02 g/mol C. 252.06 g/mol D. 152.07 g/mol

Calculations: Show ALL WORK for each of the following problems.

6. Ammonium dichromate, contains what percent ***Chromium*** by mass? **(4 pts)**

7. What is the ***mass***, in grams, of **79.7 moles** of $Al_2(SO_4)_3$? **(4 pts)**

8. How many ***atoms*** are in **0.0387 mol** of americium, Am? **(3 pts)**

9. A **379 g** sample of Technetium contains how many ***atoms***? **(5 pts)**

10. Calculate the ***mass***, in grams, of **3.34×10^{23} molecules** of At_2. **(5 pts)**

11. What is the ***volume***, in liters, of **1.04 moles** of PH_3 gas at STP? **(3 pts)**

12. What is the ***mass***, in grams, of **5.22 L** of propane, C_3H_8, at STP? **(5 pts)**

13. A compound containing carbon, hydrogen and fluorine was analyzed and found to consist of 57.54% carbon, 3.45% hydrogen, and 39.01% fluorine. The molar mass of the compound is **292.2196 g/mol**.

    a. What is the ***empirical*** formula? **(7 pts)**

    b. What is the ***molecular*** formula? **(4 pts)**

14. The <u>empirical formula</u> of a compound is known to be C_5H_7, and its molar mass is 536.8726 g/mol. What is the *molecular* formula? (4 pts)