

New West Charter High School -- Honors Chemistry -- Test #4 -- 100 points

In all that you do, be sure you concentrate your overall effort on doing whatever you can to convince the professor you have the material mastered...this is no different! Clarity and legibility! (Look 'em up.)

Be clear. Organized and orderly. Okay, now, each problem is ten points. You must do ten of the twelve. Any ten. Cross out the problems (**X** out the number of the problem) you don't want graded. I'll grade the first ten not crossed out. I'm not going to tell you that copying someone else is beneath you, alright?

- 1) Find the percentage composition in CHClFBr (I think it's called fluorochlorobromomethane). Then if you had two million molecules of it, how many chlorine atoms would you have?



- 2) The XYZ Corporation manufactures air filters which filter out harmful sulfuric acid fumes at a rate of 0.15 moles every second. In 40 minutes, how many molecules of sulfuric acid could be filtered using one?

- 3) Riboflavin, or vitamin B2, has the chemical formula $\text{C}_{17}\text{H}_{20}\text{N}_4\text{O}_6$. In a flask you are given 6.52×10^{-4} moles of it. How many carbon atoms is that?



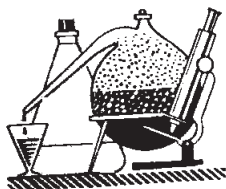
Did I mention gold goes to any perfect score of 100 (without extra credit) on this one?

- 4) An experiment is run in order to determine the number of water molecules that are part of the formula of the hydrated barium hydroxide. It was found that 0.3426 mol of the anhydrous compound had 0.2880 mol of water driven off. Find the hydrate's formula.



- 5) Galactose is the sugar that gives milk its sweet taste and its percentage composition is 40.00% carbon, 6.72% hydrogen, and 53.28% oxygen. What is the empirical formula of galactose? If the approximate molar mass of galactose is about 180 g/mol, what is the molecular formula of galactose?

- 6) A 30.534 g sample of a sulfide of gold was found to contain 24.544 g gold, and the rest, sulfur. Calculate the empirical formula of this sulfide of gold. How many moles of gold did you begin with if gold has a mass of 197 g/mol.



- 7) Cassiterite, a tin oxide ore that is uncommonly mined, has the molecular formula SnO_2 . In the refining process, two moles of carbon are used for every one mole of cassiterite refined. How many grams of carbon would be needed to refine 1000 g of cassiterite?

8) Find the percentage composition of dicyclopentadiene propoxide chloropalladium, $C_{26}H_{38}O_2Pd_2Cl_2$.

9) A certain carbohydrate molecule is found to be 52.63% carbon, 42.11% oxygen, and the remainder hydrogen. If its molecular mass is 342 g/mol, find its empirical and molecular formula.



10) Five-part question involving oxidation numbers, etc. Find the oxidation number of:

a) N in N_2O_4 _____

b) P in H_3PO_4 _____

c) Acetylene, C_2H_2 , and benzene, C_6H_6 , have the same _____ .

d) S in Na_2SO_4 _____

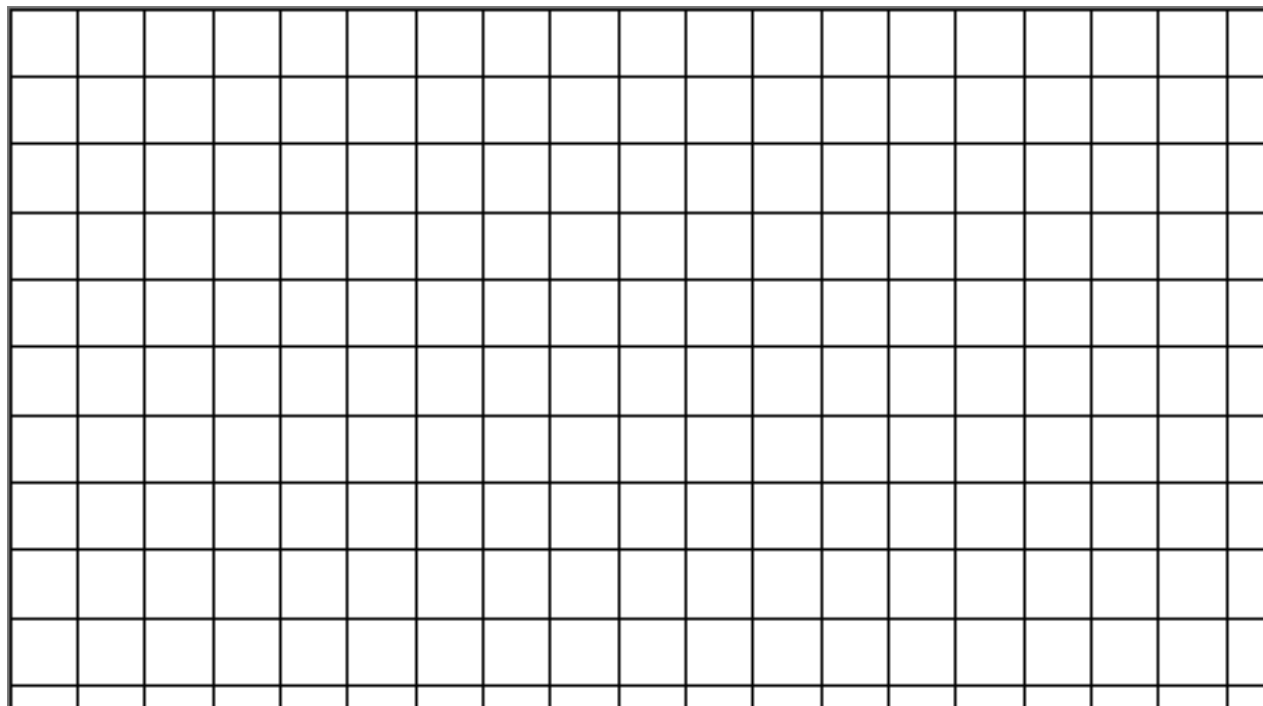
e) N in NH_4OH _____

11) Potassium ferricyanide, $K_3Fe(CN)_6$, is used in the production of blue dyes. What is the percentage composition of this compound? If you produced 4.73×10^{-19} moles of it, how many atoms of potassium is that?



- 12) Finally made it to number twelve, the last problem. How would you feel if the last one was super easy and you didn't have time to do it? Well, maybe it is or maybe it isn't...

Here is some data gathered regarding various lengths of nichrome wire. Your job is to graph it properly with axes, divisions, labels and title AND determine its linear mass density in its proper units.



Mass (g)	4.97	6.04	8.16	9.97	12.1	14.1	15.9
Length (cm)	20.5	24.9	33.5	41.0	49.8	57.8	65.5

EXTRA! EXTRA! Read All About It!

- 13) What are you reading this for? Surprised you have time to waste...get back to work!! Oh, you thought there was an extra credit one...okay, let me think of a five-pointer...

Sheesh, alright...you can even guess on this one...If a chicken and a half lays an egg and a half in a day and a half, how long would it take ten chickens to lay ten eggs?

