The Mole Review Assignment

THE MOLE - UNIT REVIEW ASSIGNMENT

Name: _____   **Block:** _____

Write the Unit Conversion and/or Equivalence Statements you need to know & use in this box

All work must be shown to receive credit on thet test….so practice showing ALL your working our NOW!

1. Define each of the following words or phrases using complete sentences.

a)   Molar Mass: _____
      _____

b)   Mole: _____

c)   Avogadro's Law: _____
      _____

d)   Empirical Formula: _____
      _____

e)   STP: _____

f)   Molarity: _____
      _____

2. Calculate the molar mass of $Mg_3(PO_4)_2 \bullet 9H_2O$

Answers for the Mole Unit Practice Test

1. Check your test definitions carefully against those given in the notes and/or text; be very critical of the quality of your answers.
2. 424.9 g
3. 2430 g
4. 0.551 mol
5. 4.11 g/L
6. Given that both samples have masses of 42.0 g, calculate the number of atoms in each by using the strategy: mass → moles of element → number of atoms of the element. Make a statement to summarize what you have demonstrated.
7. 18.3 L
8. 1.01×10^{23} atoms
9. 17.7% N, 6.3% H, 15.2%C and 60.8% O
10. a) $C_3H_5Cl_3$ b) $C_9H_{15}Cl_9$
11. 0.833g
12. $CuCl_2 \cdot 2H_2O$
13. 1.29 M
14. 74.6 g
15. 0.7813 M
16. 0.374
17. $[Mg^{+2}]$ =0.274M
    $[Rb^+]$ = 0.200M
    $[Cl^-]$ = 0.748M

3. What is the mass of 1.23×10^{25} atoms of tin?

4. Determine the number of moles of fluorine molecules contained in 12.35 L of fluorine gas at STP.

5. What is the density of dinitrogen tetroxide gas at STP?

6. Given two 42.0 g samples of Fe and Cu, show why one sample must contain more atoms than the other.

7. At STP, what volume would 37.6 g of NO_2 gas occupy?

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8. How many chlorine atoms are present in 6.67 g of $CHCl_3$?

9. Determine the percentage composition of ammonium bicarbonate.

10. The percentage composition of a certain compound is 24.4% carbon, 3.39% H, and the remainder is chlorine.
   a) Determine the empirical formula

   b) If the molar mass of the substance is 442.5 g, then what is its molecular formula?

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11. What mass of water will be driven off when 5.65 g of hydrated barium chloride, $BaCl_2 \cdot 2H_2O$, is heated?

12. Heating drives off water from the structure of hydrated copper (II) chloride. The anhydrous salt is left behind. Using the following data, determine the formula of the hydrated salt.

Mass of crucible (g)	38.44 g
Mass of crucible & hydrate (g)	45.26 g
Mass of crucible & contents after first heating (g)	43.90 g
Mass of crucible & contents after second heating (g)	43.82 g

13. What is the concentration of the solution prepared by dissolving 71.6 g of $Ca(OH)_2$ in water up to a final volume of 750.0 mL?

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14. How many grams of NaCl must be used to produce 1.50 L of a 0.850 M solution?

15. What is the final concentration when 150.0 mL of water is mixed with 250.0 mL of 1.250 M KCl solution?

16. Calculate the concentration of the solution that results when 200.0 mL of 0.500 M $Mg(NO_3)_2$ is mixed with 175.0 mL of 0.230 M $Mg(NO_3)_2$.

17. Determine the ion concentrations when 325.50 mL of 0.625 M $MgCl_2$ solution is mixed with 416.11 mL of 0.356 M RbCl solution. (*Be sure to start with the two dissociation equations*)

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