CA#3 Study Guide-Spring 2018

1. What is the mass in grams of 6.52 moles of C_8H_{16}?
2. How many moles of copper are in 6.25×10^{20} atoms of copper?
3. How many moles are in 625 g of magnesium hydroxide?
4. 3.25×10^{24} atoms of carbon would be how many moles of carbon?
5. How many molecules are in 12.0 grams of ethane?
6. Calculate the number of atoms in 28.0 grams of silver.
7. What is the molar mass of barium nitrate?
8. A molecule has an empirical formula of PH_3. Which of the following would be a possible molecular formula? A) PH_4 B) P_2H_3 C) P_2H_5 D) P_2H_6
9. What is the percent chromium in magnesium chromate?
10. A compound's empirical formula is C_2H_5 and the molar mass of the compound is 87.21 g/mole. Determine the molecular formula of the compound.
11. A compound contains 18.11 g carbon and 481.9 g bromine. What is the empirical formula of the compound?
12. Calculate the percent composition of copper (II) sulfate.
13. A compound contains 54.5 % carbon, 13.6 % hydrogen, and 31.8 % nitrogen. Calculate the empirical formula.
14. Which of the following compounds have the same empirical formula?
    A) CO_2 and SO_2 C) C_8H_{20} and $C_{30}H_{12}$
    B) N_2O_5 and N_3O_7 D) C_7H_{14} and $C_{12}H_{24}$

15. Using the reaction below, calculate the grams of PH_3 are produced when 4.6 g of hydrogen reacts? Balance the reaction first !
    P_4 + H_2 → PH_3
16. Using the reaction below, calculate the number of moles of iron that would be produced when 0.50 moles of aluminum react. Balance the reaction first !
    Al + FeO → Fe + Al_2O_3
17. Using the reaction in #16, calculate the number of moles of aluminum oxide produced when 52.0 g of FeO react.
18. Using the reaction below, calculate the grams of phosphoric acid produced when 12.0 moles of water react. Balance the reaction first !
    P_4O_{10} + H_2O → H_3PO_4
19. Using the reaction below, calculate the grams of water needed to produce 15.5 moles of hydrogen. Balance the reaction first !
    Be + H_2O → $Be(OH)_2$ + H_2
20. Predict products and balance the following reaction.

    KNO_3 (aq) + $MgCl_2$ (aq) → ??

21. Predict products and balance the following reaction.

    K_2CO_3 (aq) + $MgBr_2$ (aq) → ??

22. Write the equation for the reaction between potassium phosphate and zinc (II) nitrate.

23. For a reaction, the theoretical yield is calculated to be 65.0 g N_2. When a student carries out the experiment, they collect 52.5 g N_2. Determine the percent yield collected by the student.

24. When 10.5 grams of $Pb(NO_3)_2$ is heated in a decomposition reaction, the actual yield of PbO collected is 5.9 grams. What is the percent yield? Balance the reaction first !
    $Pb(NO_3)_2$ → PbO + NO_2 + O_2