Name_____ Date_____

AP Chemistry AUGUST Assignment

In order to activate your brain, this should be completed in August.

Welcome to AP Chemistry. This is a short assignment to get your chemistry brain warmed up. All these questions are geared to things you should be able to do when you step into AP Chem. Please complete the questions on a separate sheet of paper and ALWAYS show your work. My email is nicole.b.stransky@mcpsmd.net

This will be due on the third day of school.

Part 1- Matter

Define the following terms

1. Atom-
2. Compound-
3. Physical property-
4. Chemical property-
5. Pure substances-
6. Mixtures-
7. Heterogeneous Mixture-
8. Homogeneous mixture-
9. Mass-
10. Volume-
11. Density-
12. Precision-
13. Accuracy-

Describe the particle motion and position of the following states of matter:

14. Solid-
15. Liquid-
16. Gas-

Part 2 – Naming & Formula Writing

For the following compounds write the name or formula for the following compounds. Remember to look at charges and use roman numerals as appropriate.

1. Nitrous Acid
2. Hydrofluoric Acid
3. HCl
4. $HC_2H_3O_2$
5. calcium hydroxide
6. aluminum sulfite
7. tin (II) permanganate
8. BaO
9. K_3PO_4
10. $PbCl_4$
11. carbon dioxide
12. pentanitrogen nonafluoride
13. $XeBr_4$
14. $As_2(SO_4)_5$

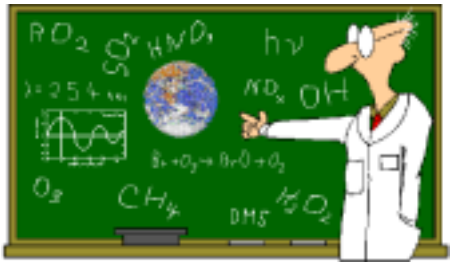
Part 3 – Reactions

For reactions 15-17 – balance the reactions

15. ___H_2SO_4 + ___NaCN → ___HCN + ___Na_2SO_4

16. ___Fe_2O_3 + ___Zn → ___ZnO + ___Fe

17. ___$HC_2H_3O_2$ + ___Al_2O_3 → ___ H_2O + ___$Al(C_2H_3O_2)_3$ *For*



reactions 18&19 - write the following reactions in symbols and balance

18. Aqueous silver nitrate reacts with solid copper metal to produce aqueous copper II nitrate and solid silver.
19. Solid calcium and chlorine gas react to produce solid calcium chloride.

For reactions 20-24 - predict the products for the following reactions, then write a complete balanced symbol reaction as seen in #15-17

20. Solid zinc reactions with hydrochloric acid

21. Liquid water decomposes

22. Solid sodium reacts with chlorine gas

23. Aqueous lead (II) nitrate reactions with aqueous calcium chloride

24. Butane burns in oxygen

Part 4 – Dimensional Analysis

Using a factor label – show your work.

25. Aiden is 32 inches tall, how many feet tall is he?

26. Double period AP chemistry class is 1.5 hours long, how many seconds is that?

27. Cole's car holds 22.5 gallons of gas, how much will it cost to fill the tank completely? (1 gallon of gas = $2.89)

28. There are 1805 students in QO, if each student takes 7 classes and each class hands out two textbooks how many books are passed out to students each year?

Part 5 – Stoichiometry

29. Tin (II) fluoride, SnF_2, is used in some toothpastes. It is made by reacting tin and hydrogen fluoride.

    a) Balance the following reaction: ____Sn + ____HF → ___SnF_2 + ___H_2

    b) How many moles of Sn react with 10 moles of HF?

    c) How many moles of SnF_2 are produced from the reaction of 30.00g of HF with Sn?

d) How many grams of HF are needed to produce 4.6 moles of hydrogen?

e) How many moles of hydrogen are produced when 6.75 moles of Sn react?

f) How many moles of hydrogen are produced when 146g of Sn react with HF?

30. In a reaction 44.5 g of N_2 are mixed with 10.5 grams of H_2 according to the following equation.

$$N_2 + 3H_2 \rightarrow 2NH_3$$

a) Theoretically, how many grams of NH_3 will be produced?

b) Which reactant is limiting?

c) If 9.41 g of NH_3 are actually produced, what is the percent yield?

31. Some sulfuric acid (H_2SO_4) is spilled on a lab bench. It can be neutralized by sprinkling sodium bicarbonate ($NaHCO_3$) on it creating liquid water (H_2O), carbon dioxide (CO_2) gas and aqueous sodium sulfate (Na_2SO_4).

a) Write the balanced chemical equation with all phases (*s, aq, l, g*).

b) If 25 mL of 6.0 M H_2SO_4 was spilled, how many moles of $NaHCO_3$ must be added to neutralize the spill?

32. One method used commercially peel potatoes is to soak them in a solution of NaOH for a short time, removed them from the NaOH and spray off the peel. The concentration of NaOH is periodically checked with the reaction of NaOH and H_2SO_4. One time 45.7 ml of 0.500 M H_2SO_4 was used to react with all 20.0 mL of NaOH.

a) Write the balanced reaction.

b) What was the concentration (M) of NaOH?