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AP Chemistry Summer Assignment

Use the following questions to review knowledge from the first year of Chemistry (and Algebra). These questions are due the first day of class. There are many resources available to review your knowledge. Khan Academy at www.khanacademy.org is a good place to start.

1. How many significant figures do the following numbers contain?

a. 0.00210500

b. 7.011

c. 4000

d. 4000.

2. Rewrite each number with three significant figures.

a. 5000

b. 0.000000074148

c. 9200000000000

d. 8.52710

3. Solve for x in each equation.

a.
$$\frac{2.1 \times 10^{-2}}{5.2 \times 10^{-3}} = \frac{k(0.10)^2 (0.20)^x}{k(0.10)^2 (0.10)^x}$$

b.
$$1.24 \times 10^{-14} = (2x)^2(x)$$

4. Label each substance as an element, compound, or mixture. Give two differences between a compound and a mixture.

a. CO₂

b. dirt

c. aluminum foil

d. salt water

5. Calculate the density of a 10.0-gram substance with a volume of 20.0 milliliters.

6. Give two properties each of solids, liquids, and gases.

7. Complete the chart.

Symbol	Atomic #	Mass #	#p ⁺	#e ⁻	#n ⁰	Charge	Family Name
	18	40				0	
Ca ²⁺					21		

8. Describe the five phase changes of matter, state whether energy is absorbed or released, and whether the process is endothermic or exothermic.

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9. Draw the Lewis dot diagram for each substance.
- N
 - carbon tetrahydride
 - SO_3^{2-}
10. Balance the equation and answer the following questions: $\text{C (s)} + \text{SO}_2\text{(g)} \rightarrow \text{CS}_2\text{(g)} + \text{CO (g)}$
- 24 g of C are mixed with 64 g of SO_2 . Which one is the limiting reactant? How many grams of carbon monoxide are formed?
 - What is the volume of 0.17 moles of CO at 800.0 mmHg and 30°C? (The balanced equation is not needed to answer this question. Use a gas law.)
11. Determine the molarity of each solution and name each solution.
- 0.70 moles C_3H_8 in 140 mL of solution
 - 140.5 g of $\text{Fe(NO}_3)_2$ in 2.4 L of water
12. Write the balanced molecular equation, complete ionic equation, and net ionic equation for the reaction between aqueous sodium carbonate and aqueous iron (III) perchlorate.
13. Write a balanced equation for the neutralization reaction between hydrochloric acid and barium hydroxide. Name the products.
14. Look up heat of formation values at http://nshs-science.net/chemistry/common/pdf/R-standard_enthalpy_of_formation.pdf and determine the ΔH for the combustion on C_2H_6 . All reactants and products are gaseous.