AP Chemistry

Summer Assignment

Kbudz – 2023 – 2024

Name: _____

The following topics below were covered in chemistry, if you need help on them, please let me know….

Topic 1: Significant Figures

1. Determine the number of significant figures in each of the following:
    a. 0.7540 _____
    b. 12500 _____
    c. 1000.01 _____
    d. 1200 _____
    e. 1.04×10^3 _____
    f. 0.0080050 _____
2. Perform the following calculations and round to the appropriate number of significant figures:
    a. 34.66 + 333.0 = _____
    b. 1.23 + 9.66 = _____
    c. 445 – 1.22 = _____
    d. 18.2 x 1.998 = _____
    e. 10.2 / 1.34 = _____
3. Round each of the following numbers to three significant figures
    a. 167.789 _____
    b. 0.00000445345 _____
    c. 25.0545 _____
    d. 3.1415926536 _____
    e. 8504.0435 _____
    f. 14.4335 _____

Topic 2: Metric and Temperature Conversions

4. Use dimensional analysis (factor-label method) to make the following metric conversions:
    a. 3.40 m to cm
    b. 289 cm to nm
    c. 125145 J to kJ
    d. 164 mg to g
    e. 46.5 mL to L
5. Make the following temperature conversions.
    a. 162˚F to ˚C
    b. 0.0˚F to K
    c. -18˚C to K
    d. 212 K to ˚C

Topic 3: Nomenclature

6. Name or write the formula for the following ionic compounds.

a. LiCl		g. tin (II) bromide	
b. $Mg(OH)_2$		h. potassium phosphate	
c. K_3P		i. nickel (II) perchlorate	
d. Fe_2O_3		j. sodium hydroxide	
e. FeO		k. zinc phosphate	
f. $ZnCl_2$		l. ammonium sulfate	

7. Name or write the formula for the following covalent compounds.

a. CO		g. nitrogen tribromide	
b. CBr_4		h. tetraphosphorus decaoxide	
c. SO_2		i. xenon hexafluoride	
d. N_2O_4		j. dicarbon tetrafluoride	

8. Name or write the formula for the following acids:

a. HCl		g. hydrobromic acid	
b. HNO_3		h. hydronitric acid	
c. $HC_2H_3O_2$		i. phosphoric acid	
d. H_2SO_4		j. hydrosulfuric acid	

Topic 4: Atomic structure

9. Determine the number of protons, neutrons, and electrons in each of the following:
   a. $^{39}_{19}K$
   b. $^{23}_{11}Na^{1+}$
   c. $^{208}_{82}Pb$
   d. $^{33}_{15}P^{3-}$

10. Write the symbol for the atom that contains:
    a. 24 protons, 21 electrons, and 24 neutrons
    b. 34 protons, 45 neutrons, and 34 electrons
    c. 8 protons, 10 neutrons, and 10 electrons

Topic 5: Writing and Balancing Chemical Equations

11. Balance the following chemical equations
    a. _____ Cr (s) + _____ O_2 (g) → _____ Cr_2O_3 (s)

    b. _____ SiH_4 (g) → _____ Si (s) + _____ H_2 (g)

    c. _____ SO_3 (g) → _____ SO_2 (g) + _____ O_2 (g)

    d. _____ $Pb(NO_3)_2$ (s) → _____ PbO (s) + _____ NO_2 (g) + _____ O_2 (g)

    e. _____ C_3H_8 (g) + _____ O_2 (g) → _____ CO_2 (g) + _____ H_2O (g)

    f. _____ C_2H_5OH (l) + _____ O_2 (g) → _____ CO_2 (g) + _____ H_2O (g)

12. Write a balanced chemical equation for each of the following reaction descriptions.
    a. When a solid calcium carbonate is heated, solid calcium oxide and gaseous carbon dioxide are formed.

    b. Aluminum metal reacts with oxygen to form solid aluminum oxide.

    c. When solid mercury (II) sulfide is heated with oxygen, liquid mercury metal and gaseous sulfur dioxide are produced.

    d. Gaseous ammonia and oxygen react to produce nitrogen monoxide gas and water vapor.

Topic 6: Moles and Stoichiometry

13. Vinegar is a dilute solution of acetic acid, CH_3COOH.
    a. Calculate the molar mass of acetic acid.

    b. How many molecules of CH_3COOH are contained within 43.4 g of acetic acid?

    c. How much would 0.450 moles of acetic acid weigh?

Topic 7: Lab Equipment

Fill out the proper title for the Lab Equipment listed below.

Name _____ Date _____ Class _____

Common Lab Equipment