CHEMISTRY 3A
EXAM 2 --- REVIEW WORKSHEET

1. Identify the following as examples of chemical or physical changes, and state whether they are endothermic or exothermic changes.

   a. cooking a steak on the grill.

   b. wet carpet becoming mildewed.

   c. tearing a piece of paper.

2. Identify the following as strong acids, weak acids, strong bases, or weak bases.

   a. Glutamic acid

   b. $Ga(OH)_3$

   c. N_2H_4

3. Identify the bold substance in each of the following equations as an acid or base.

   a. $\mathbf{PO_4^{3-}} + H_2O \rightarrow HPO_4^{2-} + OH^-$

   b. $HSO_4^- + \mathbf{H_2O} \rightarrow SO_4^{2-} + H_3O$

4. For each of the following reactions, show the products that would be expected to form and balance the equation. If no reaction would occur, simply write N.R. Also label each reaction as to type, e.g. double displacement, single displacement, precipitation, acid-base, combustion, redox, decomposition, or combination.

a. $K_3PO_{4(aq)} + Ba(NO_3)_{2(aq)} \rightarrow$

b. Hydroiodic acid + sodium carbonate

c. $C_6H_{12}O_6 + O_2 \rightarrow$

d. $Mg + Al_2O_3 \rightarrow$

5. Which of the the following would require more energy, heating a gallon of water from 20 °C to 100 °C, or heating a gallon of mercury from 20 °C to 100 °C? The density of mercury is 13.6 g/mL and the specific heat of mercury is 0.033 cal/g°C. Show your work or explain your reasoning.

6. An unknown compound consists of 0.642 g of sulfur, 0.32 g of oxygen, and 1.42 g of chlorine and has a molar mass of 119.1 g. Determine the actual formula of the compound.

7. Balance the following equations.

$MoS_2 + O_2 \rightarrow MoO_3 + SO_2$

$C_3H_8O + O_2 \rightarrow CO_2 + H_2O$

8. Calculate the number of 5d electrons in 15.0 g of gold.

9. The reaction below shows the conversion of arsenic tribromide to arsenic trichloride.

$$\mathbf{2\ AsBr_3 + 3\ Cl_2 \rightarrow 2\ AsCl_3 + 3\ Br_2}$$

a. If 27.3 g of $AsBr_3$ are available, how many grams of chlorine will be required?

b. If the above reaction yields 12.9 g of $AsCl_3$, what is the percent yield?

10. Write the names or formulas for the following acids and bases.

    a. H_3AsO_4

    b. NH_3

    c. Perbromic acid

    d. Silver(I) hydroxide