CHM 1010 **GAGE**

Practice Sheet for Chemical Reactions Answers

1. For each chemical equation below:

a complete if necessary

b) balance

c) classify the reaction type as combination (synthesis), decomposition (analysis), single replacement, double replacement or oxidation-reduction (redox)

$2\ O_3$ ----------> $3\ O_2$ oxidation-reduction

$Zn + 2\ HCl$ ----------> $ZnCl_2 + H_2$ single replacement (also redox)

$S_8 + 8\ O_2$ ----------> $8\ SO_2$ combination (synthesis)

$2\ NH_3 + 3\ CuO$ ----------> $3\ Cu + N_2 + 3\ H_2O$ oxidation-reduction

$3\ Na_2SO_4 + 2\ AlPO_4$ ----------> $Al_2(SO_4)_3 + 2\ Na_3PO_4$ double replacement

$N_2 + 3\ H_2$ ----------> $2\ NH_3$ combination (synthesis)

$3\ Na + FeCl_3$ ----------> $3\ NaCl + Fe$ single replacement

Na_2CO_3 ----------> $Na_2O + CO_2$ (balanced as is) decomposition

$Fe_2O_3 + 3\ CO$ ----------> $2\ Fe + 3\ CO_2$ oxidation-reduction

$C_2H_6O + 3\ O_2$ ----------> $2\ CO_2 + 3\ H_2O$ oxidation-reduction

$Li_2HPO_4 + Pb(NO_3)_2$ ----------> $2\ LiNO_3 + PbHPO_4$ double replacement

$2\ C_4H_{10}O_2 + 11\ O_2$ ----------> $8\ CO_2 + 10\ H_2O$ oxidation-reduction

$2\ HCl + SrCO_3$ ----------> $SrCl_2 + H_2CO_3$ or $SrCl_2 + H_2O + CO_2$ double replacement

2. Write each of the following equations in word form or translate the equation from word form to symbolic form. Be sure each symbolic form is balanced.

aqueous barium nitrate reacts with aqueous sodium sulfate to form solid barium sulfate and aqueous sodium nitrate

$Ba(NO_3)_2$ (aq) + Na_2SO_4 (aq) ------> $BaSO_4$ (s) + 2 $NaNO_3$ (aq)

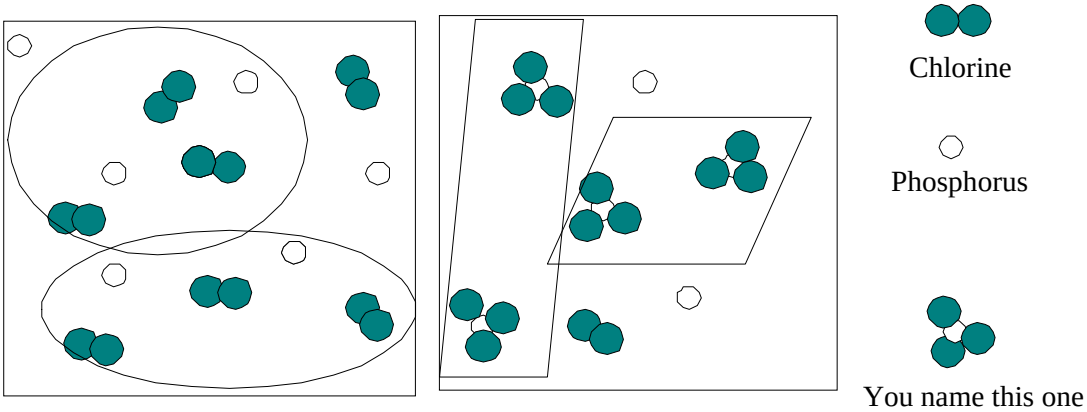
H_2SO_4 + $Al_2(CO_3)_3$ (aq) ----------> $Al_2(SO_4)_3$ (aq) + CO_2 (g) + H_2O (l)

Sulfuric acid reacts with aqueous aluminum carbonate to form aluminum sulfate in solution plus gaseous carbon dioxide and liquid water

solid sodium metal reacts with water to form aqueous sodium hydroxide and hydrogen gas

2 Na (s) + 2 H_2O (l) ----------> 2 NaOH (aq) + H_2 (g)

3. Look at the boxes below. Box A represents the materials before reaction and Box B represents materials after the reaction has gone to completion. Write the balanced chemical equation for the reaction that has taken place.



6 Cl_2 + 4 P -----> 4 PCl_3 or 3 Cl_2 + 2P -----> 2PCl_3
chlorine plus phosphorus react to form phosphorus trichloride

Notice that there are unreacted phosphorus atoms and a chlorine molecule. These cannot react because they are not in the correct proportion and are not included in the products.