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CHEMISTRY 12
CHEMISTRY 11 REVIEW ~~QUIZ~~

1. Write the **name** of the following compounds:

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a. $Pb(NO_3)_2$ __Lead (II) nitrate__   e. $Ca(OH)_2$ __Calcium hydroxide__

b. S_2O_3 __disulphur troxide__   f. CF __carbon monofluoride__

c. $FeCl_2$ __Iron (II) chloride__   g. Na_2SO_4 __Sodium sulphate__

d. N_2O_5 __dinitrogen pentoxide__   h. P_5O_2 __penta phosphorous dioxide__

2. Write the **chemical formula** for the following compounds:

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a. Aluminum chloride
__$AlCl_3$__

b. Hydrogen fluoride
__HF__

c. Copper (I) nitrate
__$CuNO_3$__

d. Silver chromate
__Ag_2CrO_4__

e. carbon monochloride
__CCl__

f. Iron (II) phosphate
__$Fe_3(PO_4)_2$__

3. Balance and **identify** the following equations as either synthesis, decomposition, single replacement, double replacement, combustion or neutralization. Then write the **names** and **phases** of the compounds into a word equation, for example:

__2__ Ba (s) + ___ O_2 (g) -----> __2__ BaO (s),   synthesis

solid barium reacts with gaseous oxygen to form solid barium oxide

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a. __2__ CH_3CH_3 (g) + __7__ O_2 (g) ----> __4__ CO_2 (g) + __6__ H_2O (g) | Combustion |

ethane gas reacts with oxygen gas to produce carbon dioxide gas and gaseous water!

b. __2__ HI (g) ---------> ___ H_2 (g) + ___ I_2 (g) | decomposition |

Hydroiodic gas breaks down to form hydrogen gas and iodine gas.
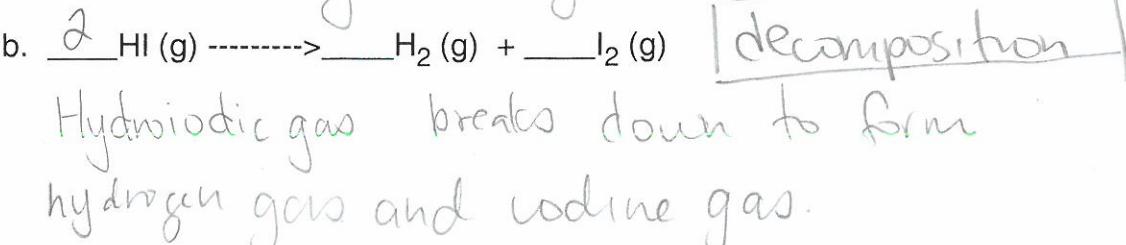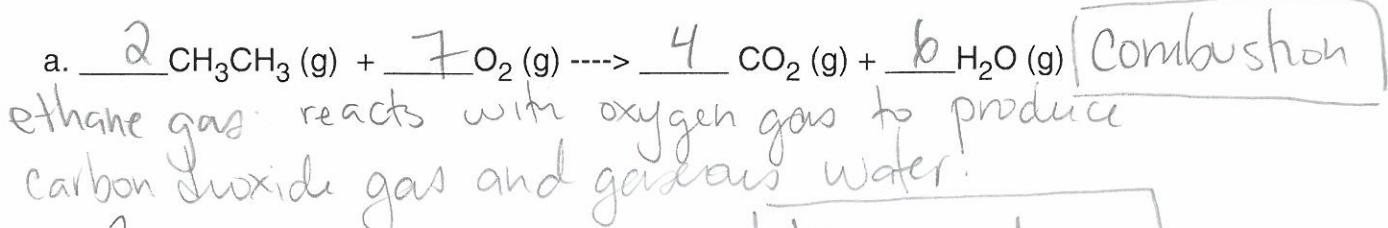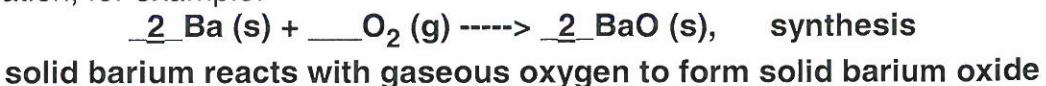
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8. Write the **dissociation/ionization** equation showing the following **solid** compounds dissolved in water:

$$NaCl \,(s) \,\text{--------}> Na^+ \,(aq) + Cl^- \,(aq)$$

a. $Na_2CO_3 \,(s) \longrightarrow 2Na^+_{(aq)} + CO_3^{2-}{}_{(aq)}$

b. $Ba(OH)_2 \,(s) \longrightarrow Ba^{2+}{}_{(aq)} + 2OH^-{}_{(aq)}$

c. $(NH_4)_2CO_3 \,(s) \longrightarrow 2NH_4^+{}_{(aq)} + CO_3^{2-}{}_{(aq)}$

$\frac{13}{3}$
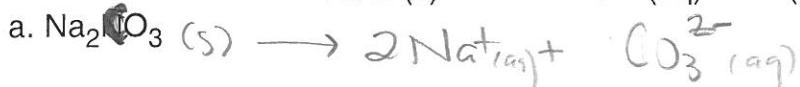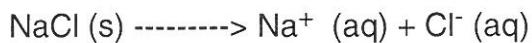
9. Calculate the resulting **ion concentrations** when the follwing solutions are mixed. Hint: first write out the dissociation equations then use $M_I V_I = M_F V_F$

a. 200.0 mL of 6.4 M AlF_3 mixed with 1.0 L of 0.20 M BaF_2

$AlF_3 \,(s) \longrightarrow Al^{3+} + 3F^-$

$BaF_2 \,(s) \longrightarrow Ba^{2+} + 2F^-$

$\frac{4}{}$
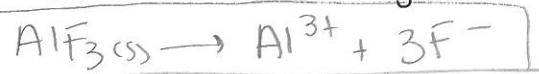
$[AlF_3]_F = \dfrac{6.4\,M \cdot 0.2000\,L}{1.2\,L}$

$= 1.0666\,M$

$\therefore [Al^{3+}] = 1.1\,M$

$[F^-] = 3.2\,M$
$+ \,0.333$

$[F^-] = 3.5\,M$
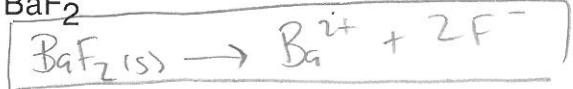
$[BaF_2]_F = \dfrac{0.20\,M \cdot 1.0\,L}{1.2\,L}$

$= 0.1666\,M$

$\therefore [Ba^{2+}] = 0.17\,M$

10. Calculate the final concentration of the solute in M (mol/L) in each of the following situations using $M_I V_I = M_F V_F$

a. 100 mL of 6.4 M HCl diluted to 5.0 L

$[HCl]_F = \dfrac{6.4\,M \cdot 0.1\,L}{5.0\,L} = \boxed{0.1\,M\;HCl}$

$\frac{1}{2}$

11. What is the concentration for KOH if 15.0 mL of this base is neutralized when titrated with 25.0 mL of 0.325 M H_2SO_4?

① $H_2SO_4 + \underline{2}KOH \longrightarrow K_2SO_4 + \underline{2}H_2O$

$0.0250\,L \times \dfrac{0.325 \text{ mol } H_2SO_4}{1\,L} \times \boxed{\dfrac{2 \text{ mol } KOH}{1 \text{ mol } H_2SO_4}} \quad ① \quad = \dfrac{1.625 \times 10^{-2} \text{ mol } KOH}{0.0150\,L}$

$\frac{13}{3}$

$\therefore [KOH] = 1.08\,M$ ①

$\frac{12}{}$

4. Identify the number of **significant figures** in the following values:

a. 0.0200350 _____ 6 _____   d. 9.800 _____ 4 _____

b. 0.000090 _____ 2 _____   e. 0.1 _____ 1 _____

c. 4025.003 _____ 7 _____   f. 200 _____ 1 _____

5. Express the **answer** with the correct number of **significant figures**:

a. 60.3 + 12.36 + 12.0= 84.66 → 84.7

b. 300 - 200.79 = 99.21 = 99

c. (13.26 + 9.87) - (18.458 + 0.987) = 3.685 → 3.69
   (23.13) - 19.445

d. (125.320 - 16.701) x (256.39 - 250.9) =
   (108.619) x (5.49) = 596 → 6.0×10^2

e. 121.3 x 26.39 = → 3201

f. 91.0 / 2.986 = 30.5

g. (198.0 - 29.633) / (35.96 - 11.111) =
   (4)(168.367) ÷ (24.849) = 6.776

6. Calculate the **molar mass** of the following compounds:
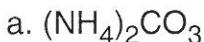
a. $(NH_4)_2CO_3$ b. $BaF_2 \cdot 5H_2O$
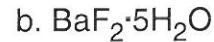
2 N = 28.0   1 Ba = 137.3
8 H = 8.0   2 F = 38.0
1 C = 12.0   10 H = 10.0
3 O = 48.0   5 O = 80.0
     96.0 g $(NH_4)_2CO_3$ 265.3 g $BaF_2 \cdot 5H_2O$

7. Calculate the number of **moles** in:
a. 295.6 g K_2S
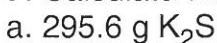
2 K = 78.2
1 S = 32.1
    110.3

$295.6 g K_2S \times \dfrac{1 \, mol \, K_2S}{110.3 g}$ = 2.680 mol K_2S

b. 755 mL of 0.64M $MgCl_2$
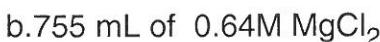
$0.755 \times \times \dfrac{0.64 \, mol \, MgCl_2}{1 \, L}$ = 0.48 mol $MgCl_2$

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