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Chemistry Review Worksheet

WARNING: ***This is a review worksheet for the chemistry concepts we have covered thus far. The following problems should seem relatively EASY for you. If they do not, then you need to catch up on your understanding ASAP or you will continue to be lost. PLEASE GET HELP ASAP (FROM ME OR A CLASSMATE)!!***

Write and balance the following equations:

1. ____ $FeCl_3$ + __3_ NaOH → ____ $Fe(OH)_3$ + _3__NaCl
2. ____ HCl + ____ $CaCO_3$ → ____ $CaCl_2$ + ____H_2O + ____ CO_2
3. _2__ NaBr + ____ CaF_2 → __2_ NaF + ____ $CaBr_2$
4. Zinc and lead (II) nitrate react to yield zinc nitrate and lead.
5. Methane and Oxygen react to produce carbon dioxide and water. $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

Read the following problems and calculate the answers. (You will have to use bridges on most of them. Get used to it!!)

1. What is the molar mass of AlBr3? How many molecules are in 208.5 g of AlBr3? **266.7g/mol; $4.71x10^{23}$**
2. How many moles are in 75.3 g of KCl?
3. If you have 3.0 moles of KBr in 5.7 liters of solution, what is the molarity of the solution? **0.53M**
4. How many grams of $Ca(OH)_2$ does 750mL of a 0.25M solution contain?
5. How many grams are in 7.95 mol of $BaCl_2$? **1655.2g**
6. How many particles are in 9.2 mol of H_2?
7. If 38g of $Ba(NO_3)_2$ are dissolved in 200.0mL of water, what is the molarity? **0.73M**
8. How much of a 2.0M solution of NaCl do you need to make a 150mL solution of 0.5M?
9. How many moles of $SrCl_2$ are in 300.0mL of a 2.4M solution? **0.72mol**
10. What is the molar mass of CaC_2O_4?
11. If 40g of NaOH are dissolved in 525mL of water, what is the molarity? **1.90M**
12. If you have 3.0L of a 2.5M solution of LiCl, how could you make 200mL of a 1.25M solution?
13. How many liters are required to prepare a 0.5M solution of CuO if 7.34g is used? **185mL**
14. What will be the volume of a 5M solution of NaOH if 35.6g is added?
15. What is the concentration of a solution prepared by mixing 3.2g of KCl in 0.5L of water? **0.086M**
16. How many grams are in 4.5mol of $CaCl_2$?
17. How many molecules are in 5.7g of NaCl? **$5.87x10^{22}$ molecules**
18. How many milliliters of an 18M solution of H_2SO_4 would you need to prepare 250mL of a 2.0M solution?
19. How many grams of K_2O are needed to prepare a 300mL 0.25M solution? **7.07g**
20. What is the concentration of a solution made from mixing 3.2g of $HC_2H_3O_2$ in 750mL of water?

Classify each reaction as combination, decomposition, single displacement, or double displacement. Then predict the product(s) for each and balance the equations:

1. $Na + O_2 \rightarrow$ **($4Na + O_2 \rightarrow 2Na_2O$)**
2. $K + Br_2 \rightarrow$
3. $MgCl_2 \rightarrow$ **($MgCl_2 \rightarrow Mg + Cl_2$)**
4. $H_2O \rightarrow$
5. $Ag_2O \rightarrow$ **($2Ag_2O \rightarrow 4Ag + O_2$)**
6. $Al(NO_3)_3 + H_2SO_4 \rightarrow$
7. $AlN + CaI_2 \rightarrow$ **($2AlN + 3CaI_2 \rightarrow 2AlI_3 + Ca_3N_2$)**
8. $MgBr_2 + NaCl \rightarrow$
9. **___2CsI___ → 2**Cs + I_2
10. _____ → Ca + N_2
11. **_$2Ca + O_2$__** → **2**CaO
12. LiCl + MgO →
13. $NaF + BaCl_2 \rightarrow$ **($2NaF + BaCl_2 \rightarrow 2NaCl + BaF_2$)**
14. Sodium hydroxide reacts with sulfluric acid →
15. ammonium chloride reacts with calcium hydroxide →

Use Le Chatelier's Principle to fill in the chart below:

CaI_2 (aq) + $Na_2C_2O_4$ (aq) → CaC_2O_4 (s) + 2NaI (aq)

Stress	Equilibrium	[CaI_2]	[$Na_2C_2O_4$]	[CaC_2O_4]	[NaI]

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	Shift				
Add CaI_2	**Right**	-----	**Decrease**	**Increase**	**Increase**
Add $Na_2C_2O_4$			-----		
Add CaC_2O_4	**Left**	**Increase**	**Increase**	-----	**Decrease**
Add NaI					-----
Remove CaI_2	**Left**	-----	**Increase**	**Decrease**	**Decrease**
Remove $Na_2C_2O_4$			-----		
Remove CaC_2O_4	**Right**	**Decrease**	**Decrease**	-----	**Increase**
Remove NaI					-----

Answer the following questions about the chemical reactions described below:

1. Suppose you react $Ca(NO_3)_2$ with BaI_2 to produce $Ba(NO_3)_2$ and CaI_2.
   a) Balance the equation. **Balanced**
   b) Predict which ratio of reactants will give the most product. **1:1**
   c) Indicate which of the following mixtures will make the largest amount of precipitate.
      i) 100 mL of 1.0 M $Ca(NO_3)_2$ + 200 mL of 2.0M BaI_2
      ii) 200 mL of 1.0 M $Ca(NO_3)_2$ + 200 mL of 2.0 M BaI_2
      iii) 100 mL of 1.0 M $Ca(NO_3)_2$ + 200 mL of 1.0 M BaI_2
      iv) 500 mL of 10 M $Ca(NO_3)_2$ + 1 L of 5.0 M BaI_2
2. Suppose you react NaCl with Ag_2SO_4 to produce Na_2SO_4 and AgCl.
   a) Balance the equation.
   b) Predict which ratio of reactants will give the most product.
   c) Indicate which of the following mixtures will make the largest amount of precipitate.
      i) 100 mL of 1.0 M NaCl + 100 mL of 0.1 M Ag_2SO_4
      ii) 200 mL of 1.0 M NaCl + 400 mL of 0.1 M Ag_2SO_4
      iii) 400 mL of 1.0 M NaCl + 200 mL of 1.0 M Ag_2SO_4
      iv) 1.0 L of 0.1 M NaCl + 2.0 L of 1.0 M Ag_2SO_4
3. Suppose you react Na_3PO_4 + $Ba(OH)_2$ to produce $Ba_3(PO_4)_2$ and NaOH.
   a) Balance the equation. **$2Na_3PO_4 + 3Ba(OH)_2 \rightarrow Ba_3(PO_4)_2 + 6NaOH$**
   b) Predict which ratio of reactants will give the most product. **2:3**
   c) Indicate which of the following mixtures will make the largest amount of precipitate.
      i) 100 mL of 2.0 M Na_3PO_4 + 100 mL of 3.0 M $Ba(OH)_2$
      ii) 200 mL of 2.0 M Na_3PO_4 + 300 mL of 3.0 M $Ba(OH)_2$
      iii) 500 mL of 0.1 M Na_3PO_4 + 200 mL of 0.1 M $Ba(OH)_2$
      (iv) 250 mL of 0.1 M Na_3PO_4 + 100 mL of 0.1 M $Ba(OH)_2$
4. Suppose you react $AlCl_3$ with KI.
   a) Predict the products and balance the equation.
   b) Predict which ratio of reactants will give the most product.
   c) Indicate which of the following mixtures will make the largest amount of precipitate.
      i) 100 mL of 0.5 M $AlCl_3$ + 300 mL of 0.1 M KI
      ii) 300 mL of 0.5 M $AlCl_3$ + 100 mL of 0.5 M KI
      iii) 100 mL of 0.5 M $AlCl_3$ + 100 mL of 1.5 M KI
      iv) 200 mL of 0.5 M $AlCl_3$ + 200 mL of 0.5 M KI

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