Experiment 22, Predicting Reactions

Name _____ Per ___

You will need to print out and bring to class: Appendix 8, and Appendix 10

Purpose: To predict reactions and then test our predictions.

Predictions: Reactions will occur if they ***remove ions*** from solutions. Ions are removed by ***precipitation, formation of water***, and the ***formation of gases***. For **REDOX** reactions, the reaction will go if the ***voltage is positive***.

Before you do the lab, Boom must sign off your predictions.

Solubility Predictions: Write the following *double displacement reactions* (switch the partners), *balance the equations*, and check the two products with Appendix 10 to see if either or both of them are precipitates. If there is a ppt, then predict that the reaction will happen. If water forms, predict that the reaction will happen.

a. $Mg(NO_3)_2 + NaOH \rightarrow$

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b. $Mg(NO_3)_2 + Na_2SO_4 \rightarrow$

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c. $Ba(OH)_2 + H_2SO_4 \rightarrow$

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d. $ZnSO_4 + (NH_4)_2CO_3 \rightarrow$

.

e. $Ba(OH)_2 + ZnSO_4 \rightarrow$

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REDOX Predictions: Using Appendix 8 (remember that one half-reaction always gets turned around and has its voltage reversed. For every LEO, there must be a GER), write the *two half-reactions* for the following: *Balance the equations to find the total reaction*, and find the *E in volts*. If the voltage is **positive**, predict that the **reaction will occur**.

f. $SO_2 + Cr_2O_7^{-2}$ --->

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g. $MnO_4^- + Cl^-$ --->

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h. $I^- + Fe^{+3}$ --->

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i. $Br^- + Fe^{+3}$ --->

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.

j. $Fe^{+2} + MnO_4^-$ --->

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Part I Testing Predictions. **GOGS ON! WARNING! NEVER carry a bottle by its stopper, cap, or dropper.**

Procedure: *After Boom hath signed off your predictions, then test your predictions as follows:*

For each trial, measure 3.0 ml portions of each solution and mix in a 13 X 150 mm test tube. *Allow time for the reaction (patience)*, List your observations. If there is a reaction, tell how it compares with your predictions above:

Shake sideways to mix well.

a. 0.1 M $Mg(NO_3)_2$ + 0.1 M NaOH

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b. 0.1 M $Mg(NO_3)_2$ + 0.1 M Na_2SO_4

.

c. 0.1 M $Ba(OH)_2$ + 0.1 M H_2SO_4

.

d. 0.1 M $ZnSO_4$ + 0.1M $(NH_4)_2CO_3$

.

e. 0.1 m $Ba(OH)_2$ + 0.1M $ZnSO_4$

.

f. 0.1 M $K_2Cr_2O_7$ + 0.1 M Na_2SO_3 + 1 drop of 6M H_2SO_4.

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Try not to get $KMnO_4$ on your hands. If you do, wash well. The stains will wear off in a few weeks.

g. 0.05 M $KMnO_4$ + 1.0 M HCl

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h 0.1 M KI + 0.1 M $FeCl_3$ + 0.5 ml (10 drops) of CCl_4. Shake sideways to mix well.

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i. 0.1 M KBr + 0.1 M $FeCl_3$ + 0.5 ml (10 drops) of CCl_4. Shake sideways to mix well.

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j. 0.1 M $FeSO_4$ + 0.1 M $KMnO_4$ + 3 drops of 6M H_2SO_4.

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Part II: More reactions for observations only.

Procedure: Measure 3.0 ml portions of each solution and mix in a test tube. *Allow time for the reaction*, if there is one (patience), then list your observations: ***Shake sideways to mix well.***

k. 0.1 M $Cr_2(SO_4)_3$ + 3 drops of 6M H_2SO_4 + 5 drops of Hydrogen Peroxide, $\mathbf{H_2O_2}$.

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l. 0.1 M $K_2Cr_2O_7$ + 3 drops of 6M H_2SO_4 + 5 drops of H_2O_2.

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0.1 M $Pb(NO_3)_2$ + 1.0 M NaCl.

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CRITIQUE: