Name_____ Date_____ Period_____

Chemical Reactions Ws #5: Single Replacement Reactions

A. Use the "Reactivity series of Metals" reference sheet or the trend in electronegativity in the Halogens to answer the following questions.

1. Would it be safe to drop a gold ring into a solution of Copper nitrate? **Yes, copper is more reactive than gold. The gold will not react in copper nitrate.**
2. Would it be safe to mix a solution of Copper nitrate with an Iron rod? **No, the iron will replace the copper in solution, thus dissolving the iron rod.**
3. Why do you think the hydrogen from steam can replace more metals in a single replacement reaction than can the hydrogen from cold water? **Water that is hot enough to become steam has more kinetic energy.**
4. Which is the most reactive of the transition metals? **Manganese**
5. Which family contains the most reactive metals? **Alkali metal family**
6. What is the trend in electronegativity for the halogens and how does this relate to their reactivity? **F is the most electronegative. Electronegativity decreases down the halogen family as does the reactivity.**
7. Which halogen will replace bromine in a reaction, but not fluorine? **Chlorine**

B. Write correct formulas for the products in these single replacement reactions. Use the "Reactivity series of Metals" reference sheet or the trend in electronegativity in the Halogens to determine if each reaction will occur. Be sure to balance each equation. If no reaction will occur, write "No Rxn"

1. **2** $Al(s)$ + **3** $Pb(NO_3)_2$ **(aq)** → **2** $Al(NO_3)_3$ **(aq)** + **3 Pb (s)**
2. Cl_2 **(g)** + **2** NaI **(s)** → **2NaCl (s)** + I_2 **(g)**
3. Cr + H_2O (l) → **No Rxn** *(Chromium will not replace the Hydrogen in water)*
4. Fe (II)+ **2** $AgC_2H_3O_2$ → $Fe(C_2H_3O_2)_2$ + **2Ag**
5. Pb + $Sn(OH)_2$ → **No Rxn** *(Tin is more reactive than lead)*
6. **2** Al **(s)** + $CuCl_2$ **(aq)** → **2**$AlCl_3$ **(aq)** + **3Cu (s)**
7. Br_2 **(g)**+ CaI_2 → **CaBr**$_2$ + I_2 **(g)**
8. **2** Al **(s)**+ **6** HCl **(aq)** → **2**$AlCl_3$ **(aq)** + **3**H_2**(g)**
9. Mg **(s)** + **2** HCl **(aq)** → $MgCl_2$ **(aq)** + H_2**(g)**
10. Ag **(s)** + NaOH**(aq)** → **No Rxn** *(silver is less reactive than sodium)*
11. Zn **(s)** + H_2SO_4 **(aq)** → $ZnSO_4$ **(aq)** + H_2**(g)**
12. **2**Fe **(s)** + **3** $CuSO_4$ **(aq)** → $Fe_2(SO_4)_3$**(aq)** + **3Cu (s)**
13. Cl_2 (s) + MgI_2 → $MgCl_2$ + I_2 (s) *at room temperature*