**Predicting Products**

### Metals plus oxygen produce metallic oxides ( synthesis reaction ) plus heat

1. Metals plus non-metals produce binary compounds ( synthesis reaction ) plus heat
2. Non-metals plus oxygen produce non-metallic oxides ( binary compounds ) ( synthesis reaction )
3. 2 non-metals produce binary compound ( see preferred valence of the more electropositive element to predict the mostly product ( synthesis reaction )
4. Reactive metals plus water produce hydroxides plus hydrogen gas ( single displacement )
5. Reactive metals plus acids produce salts plus hydrogen gas ( single displacement )
6. Metallic oxides plus water produce hydroxides ( synthesis reaction )
7. Non-metallic oxides plus water produce acidic solutions (synthesis reaction)
8. Binary compounds heated produce two elements
9. Carbonates plus heat produce oxides plus carbon dioxide gas ( decomposition )
10. Halides plus reactive halogen produce a new halide plus a new halogen (single displacement)
11. 2 soluble salts produce precipitate plus new soluble salt ( double displacement )
12. Carbonate plus acid produce salt plus water plus carbon dioxide ( double displacement followed by decomposition.
13. Acid plus base produce salt + water ( double displacement ) ( neutralization )
14. Organic compound plus oxygen produce carbon dioxide plus water ( complete combustion )

1.

a. \_\_\_ Li + \_\_\_ H2O → \_\_\_ \_\_\_\_\_\_\_\_\_\_ + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. \_\_\_ Sn + \_\_\_ FeCl2 → \_\_\_ \_\_\_\_\_\_\_\_\_\_ + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. \_\_\_ F2 + \_\_\_ KI → \_\_\_ \_\_\_\_\_\_\_\_\_\_ + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. \_\_\_ Al + \_\_\_ MgSO4 → \_\_\_ \_\_\_\_\_\_\_\_\_\_ + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e. \_\_\_ Zn + \_\_\_ CuSO4  → \_\_\_ \_\_\_\_\_\_\_\_\_\_ + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

f. \_\_\_ K + \_\_\_ H2O → \_\_\_ \_\_\_\_\_\_\_\_\_\_ + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.

a. \_\_\_ NaOH(aq) + \_\_\_ Fe(NO3)3 (aq) → \_\_\_\_\_\_\_\_\_\_(s) + \_\_\_\_\_\_\_\_\_\_\_\_\_(aq)

b. \_\_\_ Ca(OH)2 (aq) + \_\_\_ HCl(aq) → \_\_\_\_\_\_\_\_\_\_\_\_\_(aq) + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(l)

c. \_\_\_ K2CrO4(aq) + \_\_\_ NaCl(aq) → \_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. \_\_\_ K2CO3(aq) + \_\_\_ H2SO4(aq) → \_\_\_\_\_\_\_\_(aq) + \_\_\_\_\_\_\_\_(l) + \_\_\_\_\_\_(g)