

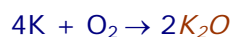
## Predicting Products of Chemical Equations.

### A. Composition Reactions.

1. Assume products of composition reactions follow ionic bonding rules and form ions found in the Table of Common Ions.

2. Example:

potassium + oxygen → *potassium oxide*



### B. Decomposition Reactions - Chlorates.

1. Metallic chlorates decompose to form a **metallic chloride and oxygen**.



2. Example:

potassium chlorate → *potassium chloride + oxygen*



### C. Decomposition Reactions - Hydroxides.

1. Metallic hydroxides decompose to form a **metallic oxide and water**.



2. Example:

potassium hydroxide → *potassium oxide + water*



### D. Decomposition Reactions - Carbonates.

1. Metallic carbonates decompose to form a **metallic oxide and carbon dioxide**.



2. Example:

potassium carbonate → *potassium oxide + carbon dioxide*

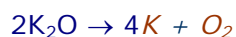


### E. Decomposition Reactions - Nonspecific.

1. If presented with a decomposition reaction that does not fit one of the other classes, assume the substance decomposes to its elements.

2. Example:

potassium oxide → *potassium + oxygen*



### F. Replacement Reactions.

1. **Not all replacements take place!** An activity series must be used to see if the uncombined element is more reactive than one of the ions making up the compound. In the characteristic equation above, A replaces B only if it is more reactive than B.
2. The reaction,  $Fe + 2HCl \rightarrow FeCl_2 + H_2$ , proceeds since iron is more reactive than hydrogen, but,

Ag + HC l → does not proceed since silver is less reactive than hydrogen.

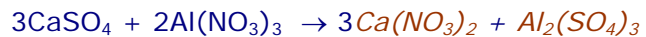
3. Write "no rxn" next to any reaction which does not occur.

G. **Ionic Reactions.**

1. Unlike replacement reactions, ionic reactions always occur.

2. Be sure to use the Table of Common Ions to determine radicals and their charges.

3. Example:



H. **Combustion Reactions.**

1. The products of combustion reactions are always carbon dioxide and water:



2. Examples:

