

**TABLE 8-3
ACTIVITY SERIES OF
THE ELEMENTS**

Activity of Metals	
Li	
Rb	
K	Can react with cold
Ba	H ₂ O and acids,
Sr	replacing hydrogen.
Ca	
Na	
<hr/>	
Mg	
Al	Can react with
Mn	steam and acids,
Zn	replacing hydrogen.
Cr	
Fe	
Cd	
<hr/>	
Co	Can react with
Ni	acids, replacing
Sn	hydrogen.
Pb	
<hr/>	
H ₂	
Sb	React with oxygen,
Bi	forming oxides.
Cu	
Hg	
<hr/>	
Ag	Fairly unreactive.
Pt	Form oxides only
Au	indirectly.

**Activity of
Halogen Nonmetals**

F ₂
Cl ₂
Br ₂
I ₂

Single Replacement ONLY

– **FREE** element must be _____ on the chart to replace in the compound.

– **The more** _____ element is higher on the chart

Forming Metal Hydroxides

3. In each of the following pair, identify the more-active element.

(a) _____ F₂ & I₂

(b) _____ Mn & K

(c) _____ Cu & H

Forming Metal Oxides

NOT GIVEN

Group 17 on PT



Look up _____ & _____ on Activity series. _____ is higher. _____



Look up _____ & _____ on Activity series. _____ is higher. _____



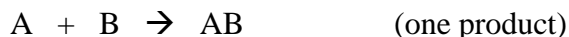
Look up _____ & _____ on Activity series. _____ is higher. _____



Look up _____ & _____ on Periodic Table. _____ is higher. _____

REACTION GUIDE

Synthesis Reactions



- Reaction whereby two or more substances combine to form a new compound.
- More than One \rightarrow One Product
- Elements react with oxygen (O_2) to form oxides.
- Two nonmetals react to form a molecular compound.
- Metals and nonmetals react to form an ionic compound.

Special Synthesis:

- * **Metal oxides** react with **carbon dioxide** to produce metal carbonates.
- * **Metal oxides** react with **water** to produce metal hydroxides.
- * **Metal oxides** react with **sulfur trioxide** to produce metal sulfates.
- * **Non-metal oxide** react with **water** to produce oxy-acids
- * **Metal chloride** reacts with **oxygen** to produce a metal chlorate

Decomposition Reactions



- Reaction whereby one substance is broken down into two or more new compounds.
- One Reactant \rightarrow More than One
- Binary compounds (those with only two elements) decompose into their individual elements when exposed to heat or electricity.

Special Decomposition:

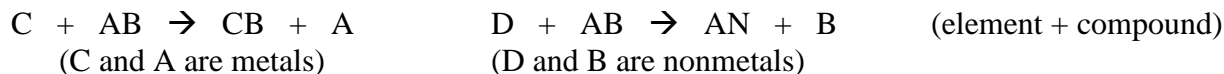
- * Metal carbonates decompose into a **metal oxide** and **carbon dioxide**.
- * Metal hydroxides decompose into a **metal oxide** and **water**.
- * Metal chlorates decompose into **metal chlorides** and **oxygen**.
- * Hydrates decompose into **anhydrous salt** and **water**.
- * Oxy-acids decompose into **non-metal oxides** and **water** (non-metal has the same ox #)

Double Replacement Reactions



Reaction whereby the ions of 2 compounds exchange places in an aqueous solution to form two new compounds.

Single Replacement Reactions



- A reaction whereby a **more reactive element** replaces a similar less reactive element in a compound.
- Metals replace metals. Nonmetals replace nonmetals.
- To see if the reaction occurs, use the activity series (in your reaction guide). The more reactive element will be the one found in the compound.
- Hydrogen in an acid can be replaced by MOST metals- see activity series.

Combustion Reactions



- Reaction where a substance (usually hydrocarbon) reacts with oxygen (O_2) to form an oxide.