

Activity Series for Metals

Elements which are higher on the list replace those which are lower on list.

Li
Rb
K
Ba
Sr
Ca
Na
Mg
Al
Mn
Zn
Cr
Fe
Cd
Co
Ni
Sn
Pb
H₂
Sb
Bi
Cu
Hg
Ag
Pt
Au

nitrate	NO ₃ ⁻
nitrite	NO ₂ ⁻
perchlorate	ClO ₄ ⁻
chlorate	ClO ₃ ⁻
chlorite	ClO ₂ ⁻
hypochlorite	ClO ⁻
acetate	C ₂ H ₃ O ₂ ⁻
permanganate	MnO ₄ ⁻
hydroxide	OH ⁻
iodate	IO ₃ ⁻

Some Polyatomic Ions

Sulfate	SO ₄ ⁻	Phosphate	PO ₄ ⁻
Sulfite	SO ₃ ⁻	Arsenate	AsO ₄ ⁻
Carbonate	CO ₃ ⁻		
Silicate	SiO ₃ ⁻		
Chromate	CrO ₄ ⁻		
DiChromate	Cr ₂ O ₇ ⁻		
Oxalate	C ₂ O ₄ ⁻		
		AMMONIUM	NH ₄ ⁺

Reaction Types

1. Double replacement (ionic)

compound + compound -----> compound + compound

cations change partners

These don't occur unless the product includes a molecule or a precipitate

2. Single replacement

single element + compound -----> single element + compound

If the single element can form a cation, it replaces a cation

If the single element can form an anion, it replaces an anion

The single element must be more active than the element it replaces.

3. Decomposition

metallic carbonates ----> metallic oxides + carbon dioxide

metallic chlorates ----> metallic chlorides + oxygen

metallic hydroxides ----> metallic oxides + water

Acids -----> nonmetal oxides + water

binary compounds -----> the individual elements which make up the compound

4. Synthesis

nonmetal oxides + water -----> acids

metal oxides + water -----> metal hydroxides

nonmetal oxides + metal oxides -----> salt

individual elements usually combine to form a binary compound

5. Combustion

hydrocarbons burn to make carbon dioxide and water

Solubility Rules

1. All common salts of alkali metals and ammonium ion are soluble
2. Acetates and nitrates are soluble.
3. Halides are soluble except for Ag, Hg (I) and Pb.
4. Sulfates are soluble **except Ba, Sr, Pb, Ca, Ag and Hg(I).**
5. Except for those in rule 1, carbonates, hydroxides, oxides, sulfides, chromates and phosphates are insoluble.