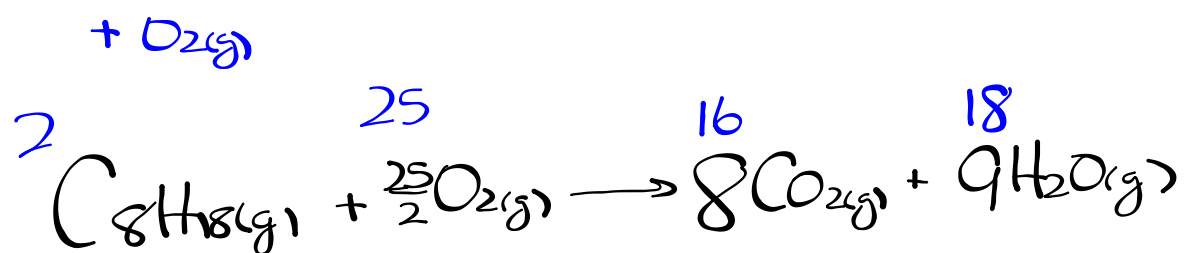


## Warm Up

Write the balanced equation for the complete combustion of octane ( $C_8H_{18(g)}$ ).



## Homework - #13-16, 20,21



## I. FORMATION

element + element  $\rightarrow$  compound

## II. DECOMPOSITION

compound  $\rightarrow$  elements

## III. COMBUSTION

element / compound +  $O_2 \rightarrow$  most common oxides

## IV. SINGLE REPLACEMENT

element + compound  $\rightarrow$  element + compound

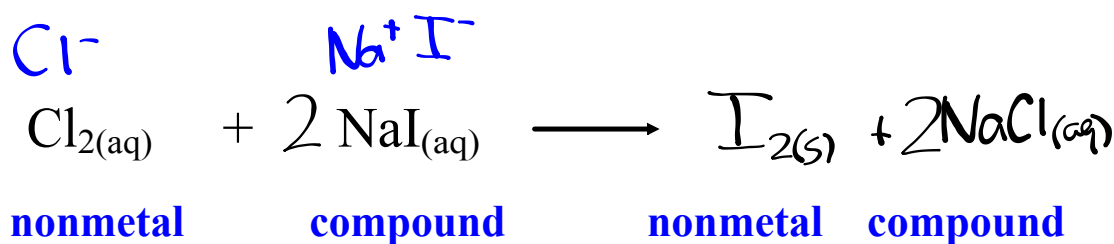
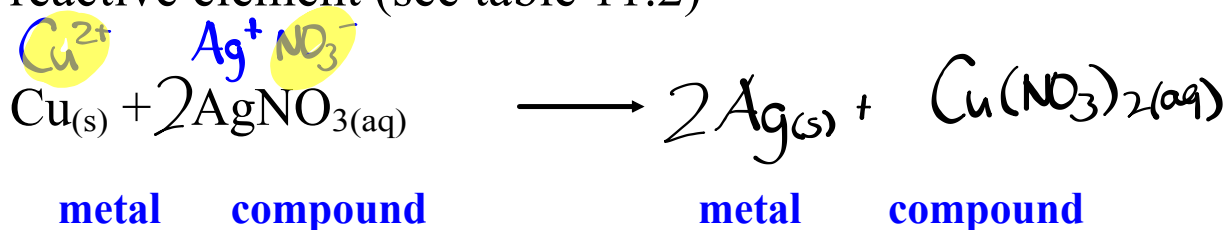
## Chemical Reactions

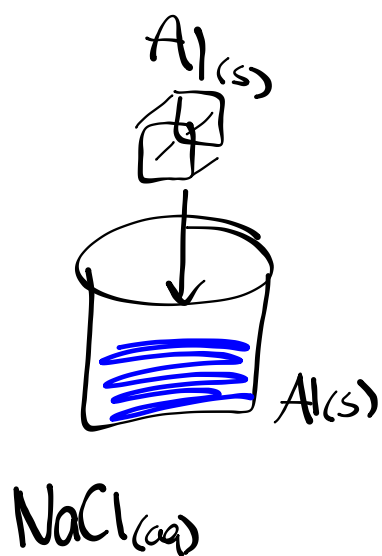
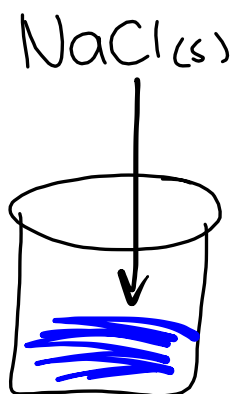
### IV. Single Replacement Reaction

Reaction of an element with a compound to produce a new element and an ionic compound.

⇒ usually occurs in aqueous solution

⇒ reaction will only occur if the element is replacing a less reactive element (see table 11.2)





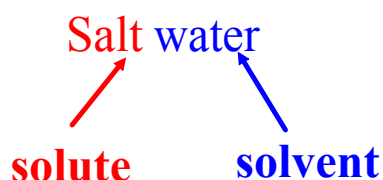
## Chemical Reactions in Solution

**Solution** - homogeneous (uniform) mixture of a solute and a solvent.

⇒ solute - substance dissolved

⇒ solvent - substance doing dissolving (liquid)

Ex.



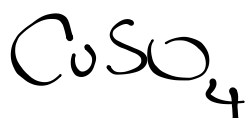
If the amount of solute that can dissolve in a solvent is large, then the solute is said to have a *high solubility*.

If the amount of solute that can dissolve in a solvent is small, then the solute is said to have a *low solubility*.

Solid substances formed from reactions in solutions are known as **precipitates**.

## Solubility Rules

- $\text{NaCl}$ ,  $\text{KNO}_3$ ,  $\text{Rb}_2\text{SO}_4$
- Group 1 Compounds have a high solubility
  - Compounds containing ammonium ( $\text{NH}_4^+$ ) have a high solubility  $\text{NH}_4\text{Cl}$
  - All acids have a high solubility  $\text{HNO}_3$ ,  $\text{CH}_3\text{COOH}$
  - Elements have a low solubility (except chlorine)
  - Solubility varies for molecular compounds



high  
(aq)

$\text{SO}_4^{2-}$   
most

$\text{NO}_3^-$   
all

low  
(s)

$\text{Ag}^+$ ,  $\text{Pb}^{2+}$ ,  $\text{Ca}^{2+}$ ,  
 $\text{Bi}^{3+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ra}^{2+}$

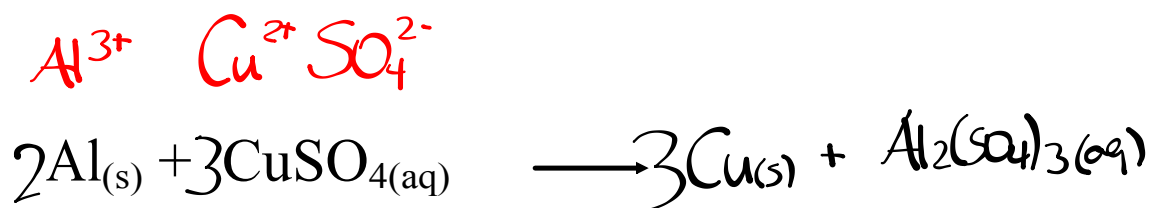
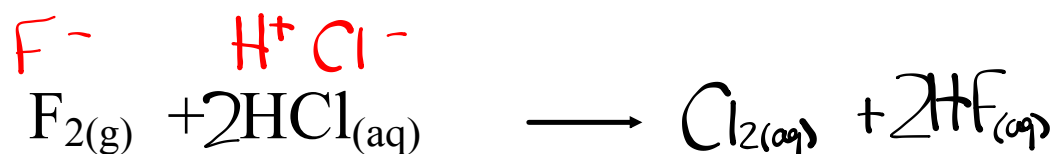
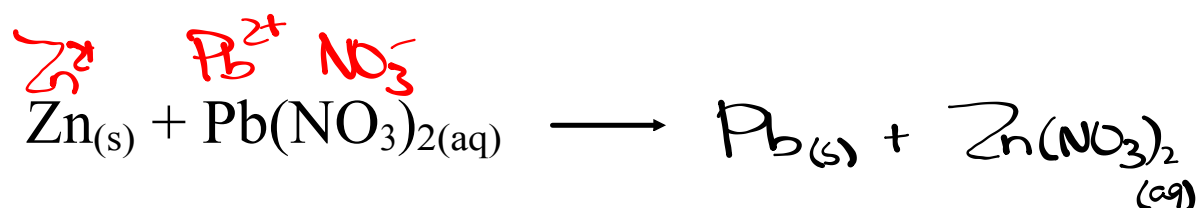
none

**Table 11.2**  
**Activity Series of Metals**

	Name	Symbol
Decreasing reactivity ↓	Lithium	Li
	Potassium	K
	Calcium	Ca
	Sodium	Na
	Magnesium	Mg
	Aluminum	Al
	Zinc	Zn
	Iron	Fe
	Lead	Pb
	(Hydrogen)	(H) <sup>+</sup>
	Copper	Cu
	Mercury	Hg
	Silver	Ag



## Practice Problems



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