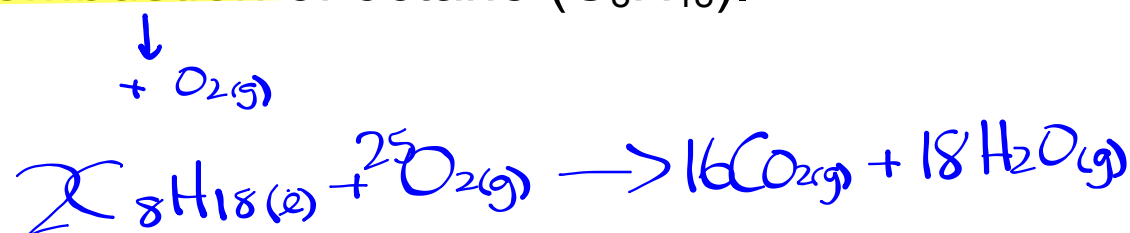


# Warm Up

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



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



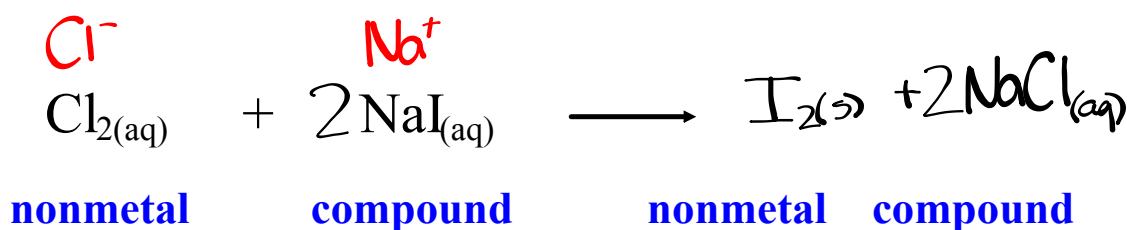
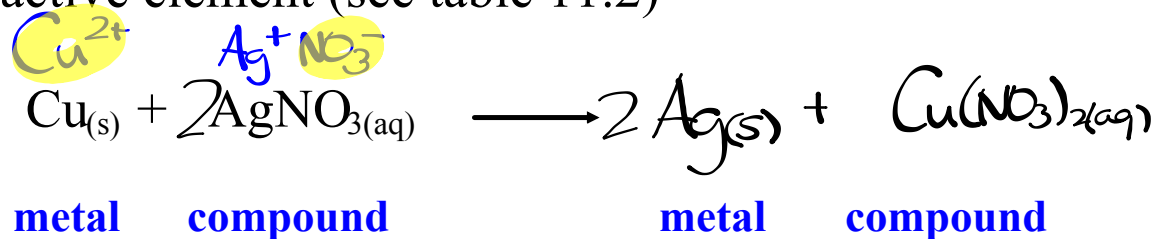
## Chemical Reactions

### 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)



## 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

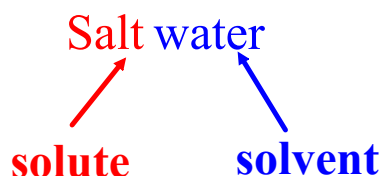
## Chemical Reactions in Solution

**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 *ahigh solubility*.

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

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

## Solubility Rules

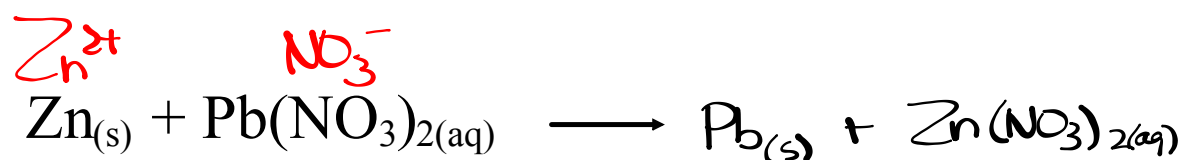
- Group 1 Compounds have a high solubility
- Compounds containing ammonium ( $\text{NH}_4^+$ ) have a high solubility
- All acids have a high solubility
- Elements have a low solubility (except chlorine)
- Solubility varies for molecular compounds

	$\text{Cu}(\text{NO}_3)_2$	<u><u>NaCl</u></u>
high (aq)	Cl <sup>-</sup> Br <sup>-</sup> I <sup>-</sup> most	NO <sub>3</sub> <sup>-</sup> all
low	Ag <sup>+</sup> , Pb <sup>2+</sup> , Tl <sup>+</sup> , Hg <sub>2</sub> <sup>2+</sup> , Cu <sup>+</sup> (Hg <sup>+</sup> )	none

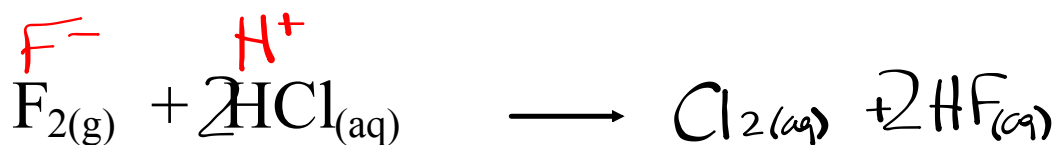
**Table 11.2**  
**Activity Series of Metals**

	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

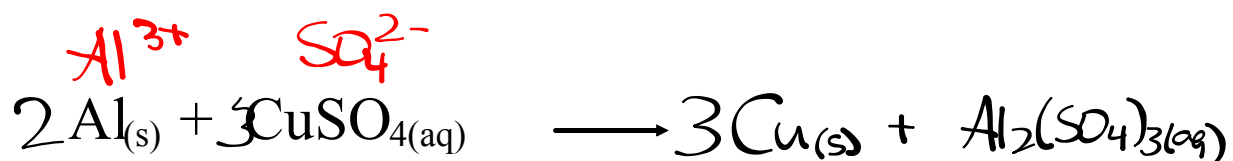
## Practice Problems



metal



nonmetal



metal



**p. 334 #17**