

Solubility of Some Ionic Compounds in Water

Always Soluble

Alkali metals =	$\text{Li}^+, \text{Na}^+, \text{K}^+, \text{Rb}^+, \text{Cs}^+$
Ammonium =	NH_4^+
Acetate =	$\text{C}_2\text{H}_3\text{O}_2^-$
Chlorate =	ClO_3^-
Nitrate =	NO_3^-
Perchlorate =	ClO_4^-

Memorize the Always Soluble Ones!

These are the only ones you need to memorize. Others will be provided as needed.

AAA
CNP

Generally Soluble

$\text{Cl}^-, \text{Br}^-, \text{I}^-$ Except when with: $\text{Ag}^+, \text{Pb}^{2+}, \text{Hg}_2^{2+}$

AP-H

F^- Except when with: $\text{Ca}^{2+}, \text{Ba}^{2+}, \text{Sr}^{2+}, \text{Pb}^{2+}, \text{Mg}^{2+}$

CBS-PM

Sulfate = SO_4^{2-} Except when with: $\text{Ca}^{2+}, \text{Ba}^{2+}, \text{Sr}^{2+}, \text{Pb}^{2+}$

CBS-P

Generally Insoluble

$\text{O}^{2-}, \text{OH}^-$ Except when with: Alkali metals and NH_4^+

AA

Somewhat soluble: $\text{Ca}^{2+}, \text{Ba}^{2+}, \text{Sr}^{2+}$

CBS

$\text{CO}_2^{2-}, \text{CO}_3^{2-}$

$\text{S}^{2-}, \text{SO}_3^{2-}$

PO_4^{3-}

$\text{CrO}_4^{2-}, \text{Cr}_2\text{O}_4^{2-}$

Except when with: Alkali metals and NH_4^+

AA

Insoluble = forms precipitate
Soluble = dissolves in water (aqueous)

Acronyms to help with memorizing the rules.

Activity Series Chart

Metals

Non-Metals

Most
Active

Name Symbol

Name Symbol

Lithium *Li*
Potassium *K*
Barium *Ba*
Strontium *Sr*
Calcium *Ca*
Sodium *Na*
Magnesium *Mg*
Aluminum *Al*
Manganese *Mn*
Zinc *Zn*
Iron *Fe*
Cadmium *Cd*
Cobalt *Co*
Nickel *Ni*
Tin *Sn*
Lead *Pb*
Hydrogen *H*
Copper *Cu*
Silver *Ag*
Mercury *Hg*
Gold *Au*

Fluorine *F*
Chlorine *Cl*
Bromine *Br*
Iodine *I*

**You do NOT need to
memorize this chart!**

If you need this
information it will be
provided to you on any
exams. If you are not
provided this information
then you can assume
the reaction takes place.

Least
Active

Elements CANNOT replace anything ABOVE them.
The reaction DOES NOT OCCUR in this situation.

Examples: $\text{ZnCl}_2 + \text{Mg} \rightarrow \text{MgCl}_2$
Magnesium is above Zinc so the reaction happens

$\text{ZnCl}_2 + \text{Cu} \rightarrow \text{No Reaction}$
Copper is below Zinc so no reaction happens