

Table of Solubilities in Water

Anions

Cations	Anions															
	Acetate $C_2H_3O_2^{-1}$	Bromide Br^{-1}	Carbonate CO_3^{-2}	Chlorate ClO_3^{-1}	Chloride Cl^{-1}	Chromate CrO_4^{-2}	Hydroxide OH^{-1}	Iodide I^{-1}	Nitrate NO_3^{-1}	Oxide O^{-2}	Oxalate $C_2O_4^{-2}$	Phosphate PO_4^{-3}	Silicate SiO_3^{-2}	Sulfate SO_4^{-2}	Sulfide S^{-2}	Sulfite SO_3^{-2}
Aluminum Al^{+3}	S	S	--	S	S	--	I	S	S	I	I	I	I	S	D	--
Ammonium NH_4^{+1}	S	S	S	S	S	S	--	S	S	--	P	S	--	S	S	S
Antimony Sb^{+3}	--	D	--	--	S	--	--	D	--	P	I	--	--	D	D	--
Arsenic As^{+3}	--	D	--	--	D	--	--	S	--	P	--	--	--	--	I	--
Barium Ba^{+2}	S	S	I	S	S	I	S	S	S	S	I	I	S	I	D	I
Bismuth Bi^{+3}	I	D	--	--	D	--	D	I	D	I	D	I	I	D	I	--
Cadmium Cd^{+2}	S	S	I	S	S	I	I	S	S	I	I	I	I	S	I	P
Calcium Ca^{+2}	S	S	I	S	S	S	I	S	S	I	I	I	I	I	I	I
Chromium(III) Cr^{+3}	S	S	--	--	S	--	I	I	S	I	S	P	--	S	I	I
Cobalt(II) Co^{+2}	S	S	I	S	S	I	I	S	S	I	I	I	I	S	I	I
Copper(II) Cu^{+2}	S	S	I	S	S	S	I	--	S	I	I	I	--	S	I	--
Iron(III) Fe^{+3}	--	S	--	--	S	S	I	--	S	I	S	I	--	S	I	--
Iron(II) Fe^{+2}	S	S	I	--	S	I	I	S	S	I	I	I	I	S	I	I
Lead(II) Pb^{+2}	S	I	I	S	P	I	I	I	S	I	I	I	I	I	I	I
Magnesium Mg^{+2}	S	S	I	S	S	S	I	S	S	I	I	I	I	S	D	S
Mercury(II) Hg^{+2}	S	P	I	S	S	P	--	I	S	I	I	--	--	D	I	--
Mercury(I) Hg_2^{+2}	I	I	I	S	I	I	--	I	D	I	I	--	--	I	I	--
Nickel(II) Ni^{+2}	S	S	I	I	S	--	I	S	S	I	I	I	--	S	I	I
Potassium K^{+1}	S	S	S	S	S	S	S	S	S	D	S	S	S	S	S	S
Silver Ag^{+1}	P	I	I	S	I	I	--	I	S	I	I	I	--	I	I	I
Sodium Na^{+1}	S	S	S	S	S	S	S	S	S	D	S	S	S	S	S	S
Strontium Sr^{+2}	S	S	I	S	S	I	I	S	S	I	I	I	I	I	I	I
Zinc Zn^{+2}	S	S	I	S	S	I	I	S	S	I	I	I	I	S	I	I

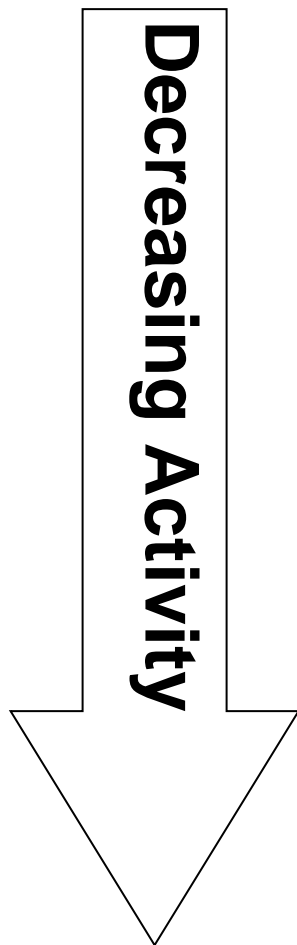
Solubility Rules

You will be working with water solutions, and it is helpful to have a few rules concerning what substances are soluble in water. The more common rules are listed below:

1. All common salts of the Group IA elements and ammonium ion are soluble.
2. All common acetates and nitrates are soluble.
3. All binary compounds of Group VIIA elements (other than F) with metals are soluble except those of silver, mercury(I), and lead.
4. All sulfates are soluble except those of barium, strontium, lead, calcium, silver, and mercury(II).
5. Except for those rules in Rule 1, carbonates, hydroxides, oxides, and phosphates are insoluble.

Activity Series of Metals

Li
K
Ba
Sr
Ca
Na
Mg
Al
Mn
Zn
Fe
Cd
Co
Ni
Sn
Pb
H
Cu
Hg
Ag
Pt
Au



Activity Series of Nonmetals

F₂
Cl₂
Br₂
I₂
S
(red) P

