

Cations and Anions

Common Cations

Ion	Name
H ⁺	hydrogen
Li ⁺	lithium
Na ⁺	sodium
K ⁺	potassium
Cs ⁺	cesium
Be ²⁺	beryllium
Mg ²⁺	magnesium
Ca ²⁺	calcium
Ba ²⁺	barium
Al ³⁺	aluminum
Ag ⁺	silver

Common Anions

Ion	Name
H ⁻	hydride
F ⁻	fluoride
Cl ⁻	chloride
Br ⁻	bromide
I ⁻	iodide
O ²⁻	oxide
S ²⁻	sulfide
N ³⁻	nitride
P ³⁻	phosphide

Ion Colours

Ion	Solution colour
Groups 1, 2, 17	colourless
Cr _(aq) ²⁺	blue
Cr _(aq) ³⁺	green
Co _(aq) ²⁺	pink
Cu _(aq) ⁺	green
Cu _(aq) ²⁺	blue
Fe _(aq) ²⁺	pale green
Fe _(aq) ³⁺	yellow-brown
Mn _(aq) ²⁺	pale pink
Ni _(aq) ²⁺	green
CrO _{4(aq)} ²⁻	yellow
Cr _{2O_{7(aq)}} ²⁻	orange
MnO _{4(aq)} ⁻	purple

Common Polyatomic Ions

Ion	Name	Ion	Name
C ₂ H ₃ O ₂ ⁻	acetate	CO ₃ ²⁻	carbonate
ClO ₃ ⁻	chlorate*	CrO ₄ ²⁻	chromate
ClO ₂ ⁻	chlorite	Cr ₂ O ₇ ²⁻	dichromate
CN ⁻	cyanide	HPO ₄ ²⁻	hydrogen phosphate
H ₂ PO ₄ ⁻	dihydrogen phosphate	C ₂ O ₄ ²⁻	oxalate
HCO ₃ ⁻	hydrogen carbonate (bicarbonate)	O ₂ ²⁻	peroxide
HSO ₄ ⁻	hydrogen sulfate (bisulfate)	SiO ₃ ²⁻	silicate
HS ⁻	hydrogen sulfide (bisulfide)	SO ₄ ²⁻	sulfate
HSO ₃ ⁻	hydrogen sulfite (bisulfite)	SO ₃ ²⁻	sulfite
ClO ⁻ , OCl ⁻	hypochlorite	S ₂ O ₃ ²⁻	thiosulfate
OH ⁻	hydroxide	BO ₃ ³⁻	borate
NO ₂ ⁻	nitrite	PO ₄ ³⁻	phosphate
NO ₃ ⁻	nitrate	P ₃ O ₁₀ ⁵⁻	tripolyphosphate
ClO ₄ ⁻	perchlorate	NH ₄ ⁺	ammonium
MnO ₄ ⁻	permanganate	H ₃ O ⁺	hydronium
SCN ⁻	thiocyanate	Hg ₂ ²⁺	mercury(I)

*There are also corresponding ions containing Br and I instead of Cl.

Ion	Flame
Li ⁺	bright red
Na ⁺	yellow
K ⁺	violet
Ca ²⁺	yellow-red
Sr ²⁺	bright red
Ba ²⁺	yellow-green
Cu ²⁺	blue (halides) green (others)
Pb ²⁺	light blue-grey
Zn ²⁺	whitish green

Solubility of Ionic Compounds at SATP

		Anions						
		Cl ⁻ , Br ⁻ , I ⁻	S ²⁻	OH ⁻	SO ₄ ²⁻	CO ₃ ²⁻ , PO ₄ ³⁻ , SO ₃ ²⁻	C ₂ H ₃ O ₂ ⁻	NO ₃ ⁻
Cations	High solubility (aq) ≥0.1 mol/L (at SATP)	most	Group 1, NH ₄ ⁺ Group 2	Group 1, NH ₄ ⁺ Sr ²⁺ , Ba ²⁺ , Tl ⁺	most	Group 1, NH ₄ ⁺	most	all
	Low Solubility (s) <0.1 mol/L (at SATP)	Ag ⁺ , Pb ²⁺ , Tl ⁺ , Hg ₂ ²⁺ (Hg ⁺), Cu ⁺	most	most	Ag ⁺ , Pb ²⁺ , Ca ²⁺ , Ba ²⁺ , Sr ²⁺ , Ra ²⁺	most	Ag ⁺	none

All Group 1 compounds, including acids, and all ammonium compounds are assumed to have high solubility in water.