

## Solubility Rules for Common Ions in Aqueous Solution

	ANIONS	CATIONS	
1	essentially all	alkali ions ( $\text{Li}^{1+}$ , $\text{Na}^{1+}$ , $\text{K}^{1+}$ , $\text{Rb}^{1+}$ , $\text{Cs}^{1+}$ , $\text{Fr}^{1+}$ )	soluble
2	essentially all	hydrogen ion ( $\text{H}^{1+}(\text{aq})$ )	soluble
3	essentially all	ammonium ion ( $\text{NH}_4^{1+}$ )	soluble
4	nitrate, $\text{NO}_3^{1-}$	essentially all	soluble
5	acetate, $\text{CH}_3\text{COO}^{1-}$	essentially all	soluble
6	chloride, $\text{Cl}^{1-}$ bromide, $\text{Br}^{1-}$ iodide, $\text{I}^{1-}$	$\text{Ag}^{1+}$ , $\text{Pb}^{2+}$ , $\text{Hg}_2^{2+}$ , $\text{Cu}^{1+}$	insoluble*
		all others	soluble
7	sulphate, $\text{SO}_4^{2-}$	$\text{Ca}^{2+}$ , $\text{Sr}^{2+}$ , $\text{Ba}^{2+}$ , $\text{Pb}^{2+}$ , $\text{Ra}^{2+}$ , $\text{Ag}^{1+}$	insoluble
		all others	soluble
8	sulphide, $\text{S}^{2-}$	alkali ions**, $\text{H}^{1+}(\text{aq})$ , $\text{NH}_4^{1+}$ , $\text{Be}^{2+}$ , $\text{Mg}^{2+}$ , $\text{Ca}^{2+}$ , $\text{Sr}^{2+}$ , $\text{Ba}^{2+}$ , $\text{Ra}^{2+}$	soluble
		all others	insoluble
9	hydroxide, $\text{OH}^{1-}$	alkali ions, $\text{H}^{1+}(\text{aq})$ , $\text{NH}_4^{1+}$ , $\text{Sr}^{2+}$ , $\text{Ba}^{2+}$ , $\text{Ra}^{2+}$	soluble
		all others	insoluble
10	phosphate, $\text{PO}_4^{3-}$ carbonate, $\text{CO}_3^{2-}$ sulphite, $\text{SO}_3^{2-}$	alkali ions, $\text{H}^{1+}(\text{aq})$ , $\text{NH}_4^{1+}$	soluble
		all others	insoluble

insoluble\* means low solubility and can involve lengthy calculations in grade twelve chemistry

alkali ions\*\* are:  $\text{Li}^{1+}$ ,  $\text{Na}^{1+}$ ,  $\text{K}^{1+}$ ,  $\text{Rb}^{1+}$ ,  $\text{Cs}^{1+}$ ,  $\text{Fr}^{1+}$