Solubility of Ionic Compounds

Classes of soluble compounds

- compounds of the alkali metals (1A)
- ammonium (NH_4^+) compounds
- \bullet nitrates (NO $_3^-$), chlorates (ClO $_3^-$), perchlorates (ClO $_4^-$), acetates (CH $_3$ CO $_2^-$)
- chlorides (Cl⁻), bromides (Br⁻), iodides (I⁻), **except**: Pb²⁺, Ag⁺, Hg₂²⁺
- sulfates (SO₄²⁻), **except**: Sr²⁺, Ba²⁺, Pb²⁺, Ca²⁺, Hg₂²⁺, Ag⁺ (the last three are slightly soluble)

Classes of insoluble compounds

- carbonates (CO_3^{2-}) , phosphates (PO_4^{3-}) , oxalates $(C_2O_4^{2-})$, chromates (CrO_4^{2-}) , except: alkali metals, NH_4^+
- sulfides (S²⁻), **except**: alkali metals, NH₄⁺, alkaline earth metals (2A) (CaS, SrS, and BaS are slightly to moderately soluble),
- hydroxides (OH⁻), oxides (O²⁻), **except**: alkali metals, alkaline earth metals (Ca(OH)₂ and Sr(OH)₂ are only slightly soluble; Mg(OH)₂ is only very slightly soluble)