

Solubility Rules (Classified by Anion)

The following ionic compounds are soluble, meaning that a solution with a concentration of at least 0.1 M can be prepared at room temperature:

- those containing nitrate (NO_3^-) and acetate (CH_3COO^-)
- those containing chloride (Cl^-), bromide (Br^-), and iodide (I^-), *except* those of Ag^+ , Cu^+ , Hg_2^{2+} , and Pb^{2+}
- those containing sulfate (SO_4^{2-}) *except* for CaSO_4 (*ss*), SrSO_4 , BaSO_4 , Hg_2SO_4 (*ss*), Ag_2SO_4 (*ss*) and PbSO_4

The following ionic compounds are insoluble, meaning that a saturated solution has a concentration of less than 0.001 M at room temperature:

- those containing sulfide (S^{2-}) *except* for $(\text{NH}_4)_2\text{S}$, and the alkali metal and alkaline earth sulfides, such as Na_2S and CaS
- those containing carbonate (CO_3^{2-}) *except* for $(\text{NH}_4)_2\text{CO}_3$ and the alkali metal carbonates, such as Na_2CO_3
- those containing phosphate (PO_4^{3-}) *except* for $(\text{NH}_4)_3\text{PO}_4$ and the alkali metal phosphates, such as Na_3PO_4
- those containing hydroxide (OH^-) *except* for $\text{Ca}(\text{OH})_2$ (*ss*), $\text{Sr}(\text{OH})_2$, $\text{Ba}(\text{OH})_2$, and the alkali metal hydroxides, such as NaOH
- those containing oxide (O^{2-}) *except* for CaO (*ss*), SrO , BaO , and the alkali metal oxides, such as Na_2O

Some compounds fall between the extremes of soluble and insoluble; they are considered slightly soluble and, in the table shown above, are indicated as such by the symbol (*ss*).