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**Solubility Guidelines\***

*\*Pertains to substances in water at room temperature and standard pressure.*

1. Salts containing Group I elements (Li+, Na+, K+, Cs+, Rb+) or ammonium ions (NH4+) are soluble.
2. Salts containing nitrates (NO3-), acetates (C2H3O2-), chlorates (ClO3-), and perchlorates (ClO4-) are generally soluble.
3. Binary compounds of halogens (Cl-, Br-, or I-) with metals are generally soluble. Exceptions to this include halide salts of fluoride (F-), silver (Ag+), lead (Pb2+), and mercury (Hg2+). Lead halides are, however, soluble in hot water. Most silver salts are insoluble except for AgNO3 and Ag(C2H3O2).
4. Most sulfate salts (SO42-) are soluble. Exceptions to this include CaSO4, BaSO4, Ag2SO4, HgSO4, and SrSO4, which are slightly soluble. PbSO4 is poorly soluble.
5. Most hydroxide salts (OH-) are insoluble. Exceptions include hydroxide salts of Group I elements, transition metals, aluminum, and ammonium. Hydroxide salts of Group II elements (Ca2+, Sr2+, and Ba2+) are only slightly soluble.
6. Most sulfides (S2-) of transition metals are highly insoluble, including CdS, FeS, ZnS, and Ag2S. Arsenic, antimony, bismuth, and lead sulfides are also insoluble. However, calcium (Ca2+), barium (Ba2+), strontium (Sr2+), magnesium (Mg2+), sodium (Na+), potassium (K+), and ammonium (NH4+) sulfides are soluble.
7. Carbonates (CO32-), oxalates (C2O42-), chromates (CrO42-), phosphates (PO42-), and fluorides (F-) are frequently insoluble. Although, compounds containing Group I elements or ammonium are soluble, except for lithium phosphate, which is poorly soluble.

With the chart below, the empirical formula of the compound can be used to determine solubility by cross referencing the cations (top row) with anions (first column). For less common compounds, you can consult a periodic table  while using the solubility guidelines listed above.

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