

## **THE SOLUBILITY RULES:**

1. The nitrates, nitrites, chlorates, and acetates of all metals are soluble in water. Silver acetate, silver nitrite, and potassium perchlorate are sparingly soluble.
2. All sodium, potassium, and ammonium salts are soluble in water.
3. The chlorides, bromides, and iodides of all metals except lead, silver, and mercury (I) are soluble in water.  $\text{HgBr}_2$  is moderately soluble.  $\text{PbCl}_2$ ,  $\text{PbBr}_2$ , and  $\text{PbI}_2$  are soluble in hot water. The water-insoluble chlorides, bromides, and iodides are also insoluble in dilute acids.
4. The sulfates of all metals except lead, strontium, mercury (I), and barium are soluble in water. Silver sulfate and calcium sulfate are slightly soluble. The water-insoluble sulfates are also insoluble in dilute acids.
5. The carbonates, phosphates, borates, sulfites, chromates, and arsenates of all metals except sodium, potassium, and ammonium are insoluble in water, but soluble in dilute acids.  $\text{MgCrO}_4$  is soluble in water;  $\text{MgSO}_3$  is slightly soluble in water.
6. The sulfides of all metals except lithium, barium, calcium, magnesium, potassium, sodium, and ammonium are insoluble in water.  $\text{BaS}$ ,  $\text{CaS}$ , and  $\text{MgS}$  are sparingly soluble.
7. The hydroxides of lithium, sodium, potassium, and ammonium are very soluble in water. The oxides and hydroxides of calcium, strontium and barium are moderately soluble. The oxides and hydroxides of all other metals are insoluble.