

KNOW THE 6 SOLUBILITY RULES!!

Rule 1: ALWAYS SOLUBLE SALTS (NO EXCEPTIONS!)

Salts containing:

- Group 1A (alkali metal) ions - **Na⁺ K⁺ Rb⁺ Li⁺**
- Ammonium (**NH₄⁺**) salts
- Nitrate (**NO₃⁻**) Chlorate (**ClO₃⁻**), Perchlorate (**ClO₄⁻**)
- Acetate (CH₃COO⁻) or C₂H₃O₂⁻

*****Rules 2- 6: Soluble Salts (with Exceptions)

Rule 2: HALOGEN SALTS:

All Halogen Salts (Cl, Br, I-) salts are soluble
EXCEPT for those of Ag⁺ Pb²⁺ and Hg₂²⁺

Rule 3: SULFATE (SO₄²⁻) SALTS:

All Sulfate (SO₄²⁻) salts are soluble EXCEPT those
Of Ba²⁺ Sr²⁺, Ca²⁺ Pb²⁺ Hg₂²⁺

Rule 4: HYDROXIDE (OH-)SALTS

Only Hydroxides of NaOH, KOH, Ba(OH)₂ and Ca(OH)₂ are soluble

Rule 5: SULFIDE (S²⁻)SALTS:

Only Groups 1A and 2A, & NH₄⁺ sulfides are SOLUBLE!

Rule 6: Phosphates PO₄³⁻ , Carbonate CO₃²⁻ Chromate CrO₄²⁻

All Insoluble EXCEPT if combined with NH₄⁺, Li⁺, Na⁺ K⁺ ions

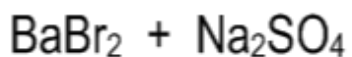
Sample Exercise:

Classify the following salts as *soluble* or *insoluble* according to the solubility rules:

- a) Sodium phosphate
- b) Calcium carbonate
- c) Barium sulfate
- d) Silver Chloride
- e) Copper Sulfide
- f) Zinc Nitrate
- g) Lead (II) Iodide
- h) Ammonium chloride
- i) Potassium Nitrate

Sample Exercise II :

If we mix Barium Bromide and Sodium Sulfate:



- a) Will a precipitate form?
- b) What are the spectator ions?
- c) What is the NET Ionic Equation