

**Conjugate Acids and Bases**

Weak Acid	Weak Base
CH <sub>3</sub> COOH	CH <sub>3</sub> COO <sup>-</sup>
NH <sub>4</sub> <sup>+</sup>	NH <sub>3</sub>
H <sub>2</sub> CO <sub>3</sub>	CO <sub>3</sub> <sup>2-</sup>
H <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	C <sub>2</sub> O <sub>4</sub> <sup>2-</sup>
H <sub>2</sub> SO <sub>3</sub>	SO <sub>3</sub> <sup>2-</sup>
H <sub>2</sub> S	S <sup>2-</sup>
H <sub>3</sub> PO <sub>4</sub>	PO <sub>4</sub> <sup>3-</sup>
HCN	CN <sup>-</sup>
HF	F <sup>-</sup>
NHO <sub>2</sub>	NO <sub>2</sub> <sup>-</sup>
HClO	ClO <sup>-</sup>

Gas Forming Reactions
$2\text{H}^+ + \text{CO}_3^{2-} \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
$2\text{H}^+ + \text{S}^{2-} \rightarrow \text{H}_2\text{S}(\text{g})$
$2\text{H}^+ + \text{SO}_3^{2-} \rightarrow \text{H}_2\text{O}(\text{l}) + \text{SO}_2(\text{g})$
$2\text{H}^+ + \text{M} \rightarrow \text{M}^{2+} + \text{H}_2(\text{g})$

**Determining Net Ionic Equations**

1. Write all reactants as they exist in solution
2. Identify acids and bases
  - a. If both an acid and a base are present, an acid-base reaction occurs
  - b. Look for hidden bases that are anions in other ionic compounds (e.g., CO<sub>3</sub><sup>2-</sup> in CaCO<sub>3</sub>)
3. Look for ions that will form an insoluble compound. If so, they form a precipitate.
4. Look for one of the known gas-forming reactions
5. Write out the products as they exist in solution
6. Cancel spectator ions. Ions that are always soluble will be spectator ions in acid-base or precipitation reactions.