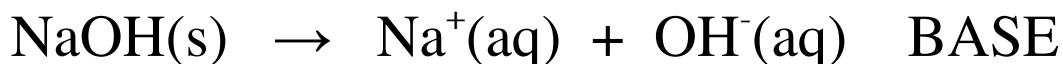


Characteristics of Acids & Bases

- acids & bases are both ionic compounds dissolved in water
 - > both ionic = both electrolytes (conduct elec)
- Arrhenius theory (Swedish scientist Arrhenius (1859-1927))

ARRHENIUS THEORY

an **ACID** is any compound that produces hydrogen ions, $\text{H}^+(\text{aq})$, in water
a **BASE** is any compound that produces hydroxide ions, $\text{OH}^-(\text{aq})$, in water



To simplify,

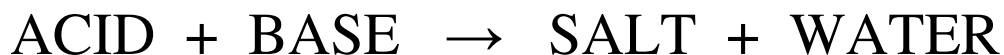
ACIDS = ionic compounds that **begin with "H"**

BASES = ionic compounds that **end in "OH"**

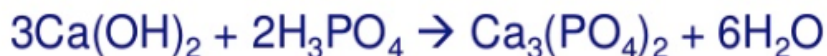
SALTS = all **other** ionic compounds

NOTE: Organic acids have formulas that end in "COOH" - do not confuse these with bases!

- when an acid and a base are mixed, a neutralization reaction occurs



ex. Write the neutralization reaction between H_3PO_4 and $\text{Ca}(\text{OH})_2$.



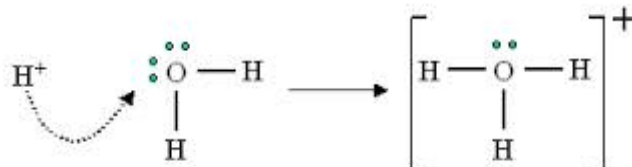
Properties of ACIDS (due to presence of H^+):

- > taste sour
- > conduct an electric current
- > turn litmus paper **red**
- > produce hydrogen when reacted with certain metals
- > neutralized by bases

Properties of BASES (due to presence of OH^-):

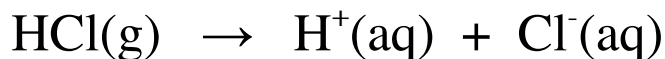
- > taste bitter
- > conduct an electric current
- > turn litmus paper **blue**
- > feel slippery
- > neutralized by acids

- when an acid is dissolved in water, it produces a hydrogen ion or proton, $H^+(aq)$
 - > protons do not exist on their own in water, but rather attach themselves to water molecules to produce hydronium ions or hydrated protons, H_3O^+

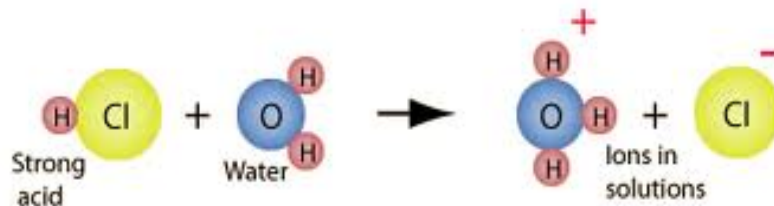
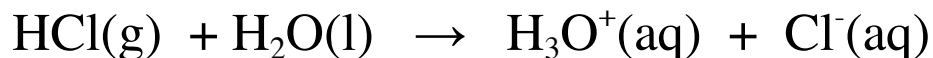


H^+ is called a PROTON
 H_3O^+ Is called the HYDRONIUM ION

- > to show that hydronium ions are produced when an acid ionizes . . .



can be written as



- > the second equation results from adding H_2O on both sides of the first equation, but on the product side, the added H_2O combines with H^+ to form H_3O^+