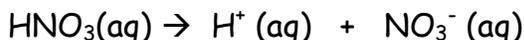


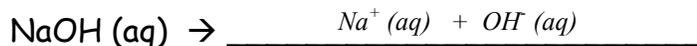
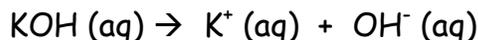
What are Acids, Bases, and Salts?

The Swedish chemist Svante Arrhenius introduced the theory of ionization and used this theory to explain much about the behavior of acids and bases.

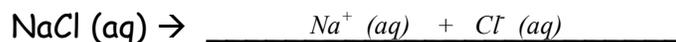
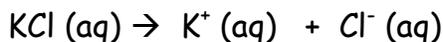
- ◆ An Arrhenius acid is defined as any compound that dissociates in aqueous solution to form            $H^+$            ions.



- ◆ An Arrhenius base is defined as any compound that dissociates in aqueous solution to form            $OH^-$            ions.



- ◆ Salts are compounds that dissociate in aqueous solution releasing neither            $H^+$            ions nor            $OH^-$            ions.



Using the *Arrhenius definition*, classify the following examples as acids, bases, or salts:

HBr	<u>          acid          </u>	KCl	<u>          salt          </u>
Mg(OH) <sub>2</sub>	<u>          base          </u>	H <sub>3</sub> PO <sub>4</sub>	<u>          acid          </u>
HCl	<u>          acid          </u>	HClO	<u>          acid          </u>
KNO <sub>2</sub>	<u>          salt          </u>	Al(OH) <sub>3</sub>	<u>          base          </u>
HFO <sub>4</sub>	<u>          acid          </u>	KC <sub>2</sub> H <sub>3</sub> O <sub>2</sub>	<u>          salt          </u>
Ba(OH) <sub>2</sub>	<u>          base          </u>	NaCl	<u>          salt          </u>

Acids and bases can also be identified using an operational definition. Operational definitions are simply a list of properties.

### ACIDS:

- ◆ A sour taste is a characteristic property of all acids in aqueous solution.
- ◆ Acids react with some metals to produce hydrogen gas.
- ◆ Because aqueous acid solutions conduct electricity, they are identified as electrolytes.
- ◆ Acids react with bases to produce a salt and water.
- ◆ Acids turn indicators different colors.

### BASES:

- ◆ Bases tend to taste bitter and feel slippery.
- ◆ Like acids, aqueous basic solutions conduct electricity, and are identified as electrolytes.
- ◆ Bases react with acids to produce a salt and water.
- ◆ Bases turn indicators different colors.

### Naming Acids, Bases, and Salts

Since bases and salts are ionic compounds, they are named in the usual way:

$\text{KNO}_3$  potassium nitrate

$\text{NH}_4\text{OH}$  ammonium hydroxide

$\text{KNO}_2$  potassium nitrite

$\text{Al}(\text{OH})_3$  aluminum hydroxide

- **Binary acids** consist of two elements, the first being hydrogen.

Binary acids are named using the format:

**hydro\_(root word of second element)\_ic acid**

- **Ternary acids** consist of three elements. Do **NOT** use a prefix. Simply change the ending of the polyatomic ion's name and add the word "acid":

**-ate becomes -ic and -ite becomes -ous**

Name the following acids:

$\text{H}_3\text{PO}_3$  phosphorous acid

$\text{HC}_2\text{H}_3\text{O}_2$  acetic acid

$\text{H}_2\text{CO}_3$  carbonic acid

$\text{HClO}_2$  chlorous acid

$\text{HF}$  hydrofluoric acid

$\text{H}_2\text{SO}_3$  sulfurous acid