**Chemistry**  Name:

**Chapter 14:** Acids and Bases

14-1: Properties of Acids and Bases

**Acids**

1. taste.

2. React with bases to produce

3. electric current.

**Acid Nomenclature**

* **Binary acid** - acid that contains only : hydrogen and one of the more electronegative elements.
  + HF, HCl, HBr, and HI

Binary Acid Nomenclature

1. The name of a binary acid begins with the

2. The of the second element follows this prefix.

3. The name then ends with the suffix -ic.

* **Oxyacid** - acid that is a compound of and a third element, usually a nonmetal.
  + HNO3, H2SO4
  + The names of their anions are based on the names of the acids.

**Some Common Industrial Acids**

* **Sulfuric Acid**
  + Sulfuric acid is the most commonly produced in the world.
  + refining
  + Car
  + **Nitric Acid**
  + Making
* **Phosphoric Acid**
  + Manufacturing and animal
* **Hydrochloric Acid**
  + acid
  + “Pickling” steel
  + Concentrated solutions of hydrochloric acid are commonly referred to as
  + **Acetic Acid**
  + Pure acetic acid is a clear, colorless, and pungent-smelling liquid known as *glacial acetic acid*.

**Bases**

1. taste

2. Dilute aqueous solutions

3. Bases react with acids to produce salts and water.

4. Bases conduct

**Arrhenius Acids and Bases**

* **Arrhenius acid** - chemical compound that increases the concentration of ions, H+, in aqueous solution.
* **Arrhenius base** - substance that increases the concentration of ions, OH−, in aqueous solution.
* All aqueous acids are

**Strength of Acids**

* **Strong acid** - completely in aqueous solution.
  + a strong acid is a strong
  + HClO4, HCl, HNO3

**Aqueous Solutions of Bases**

* Most bases are containing metal cations and the hydroxide anion, OH−
  + dissociate in water
* Ammonia, NH3, is molecular
  + Ammonia produces when it reacts with water molecules.

14-2: Acid-Base Theories

* **Brønsted-Lowry acid** - molecule or ion that is a
* Hydrogen chloride acts as a Brønsted-Lowry acid when it reacts with ammonia.
* Water can act as a Brønsted-Lowry acid.
* - molecule or ion that is a proton acceptor.
* Ammonia accepts a proton from the hydrochloric acid. It acts as a .
* **Brønsted-Lowry acid-base reaction -** protons are transferred from one reactant (the acid) to another (the base).
* **Monoprotic acid** - acidthatcan donate only (hydrogen ion) per molecule.
  + HClO4, HCl, HNO3
  + only one
* **acid** - acid that can donate more than one proton per molecule.
  + H2SO4, H3PO4
  + Multiple ionization steps
* **Diprotic acid** - donates per molecule
  + H2SO4
* **Triprotic acid** - donates per molecule.
  + H3PO4
* **Lewis acid** - an atom, ion, or molecule that to form a covalent bond.

14-3: Acid-Base Reactions

**Conjugate Acids and Bases**

* - species that remains after a Brønsted-Lowry acid has given up a proton
* The stronger an acid is, the its conjugate base
* The stronger a base is, the weaker its
* Proton transfer reactions favor the production of the and the weaker base.

**Amphoteric Compounds**

* **Amphoteric** - any species that can react as either an
  + example: water

**Neutralization Reactions**

* **Neutralization** - reaction of to form water molecules in aqueous solutions
* - ionic compound composed of a cation from a base and an anion from an acid.

**Acid Rain**

* NO, NO2, CO2, SO2, and SO3 gases from industrial processes can dissolve in atmospheric water to produce acidic solutions.
* *- v*ery acidic rain
* Acid rain can and affect ecosystems.