Acids and bases

The behaviour of the chemical determines if it is an acid or a base

Acids

- Molecular compounds
- Chemical formulas of acids normally start with a hydrogen

- They taste sour
- Corrosive to skin, metals and limestone
- They turn litmus paper red
- They have a pH below 7
- They are electrolytes - they conduct electricity when dissolved in water because ions are formed
- When they dissolve in water they produce hydrogen ions
    - Hydrogen ions are what make acids dangerous

- When an acid reacts with metal it produces hydrogen gas which is explosive

- When an acid reacts with carbonates it produces carbon dioxide

- Acids are made when nonmetal oxides react with water

Types of Acids

- Binary Acids
  -
  -
  -
- Oxyacids
  -
  -
  -
- Organic Acids - formula has “COOH”
  - Vinegar - CH_3COOH
  - Citric acid - $C_3H_5O(COOH)_3$- sour candies
  - Ascorbic acid - $C_5H_7O_4(COOH)$ - vitamin C
  - Formic acid - HCOOH - ants

Acid Rain

- Cars and factories produce carbon dioxide nitrogen dioxide and sulfur dioxide
- These oxides react with water to produce acids (carbonic acid, nitric acid, sulfuric acid)

- Acid rain destroys statues made out of limestone (carbonate)
- Acid rain also causes your car to rust faster
- We put catalytic converters on cars to reduce the pollution and to reduce acid rain
- Factories install “scrubbers” to reduce their pollution

Bases

- Most bases are ionic compounds
- Chemical formulas of bases normally end with a hydroxide ion

- They taste bitter
- They feel slippery
- Corrosive to skin but they **do not** react with metal
- They have a pH above 7
- They turn litmus paper blue
- They are also called electrolytes because they produce ions
- They dissolve in water and produce hydroxide ions

- Hydroxide ions are what make bases dangerous
- Bases are made by reacting metal oxides with water

- Bases only react with organic material, oils or with acids

- We use bases as cleaning products
- Examples
    - Sodium hydroxide is oven cleaner
    - Calcium hydroxide is lye which is added to soils
    - Magnesium hydroxide is found in Tums

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