Solutions of Acids and Bases

Objectives

- **Explain** the difference between strong acids and bases and weak acids and bases.
- **Identify** acids and bases by using the pH scale.
- **Describe** the formation and uses of salts.

I. Strengths of Acids and Bases

A. Strong Versus Weak Acids As an acid dissolves in water, the acid's molecules break apart and produce hydrogen ions, H^+ . If all of the molecules of an acid break apart, the acid is called a strong acid . If only a few molecules of an acid break apart, the acid is a weak acid.

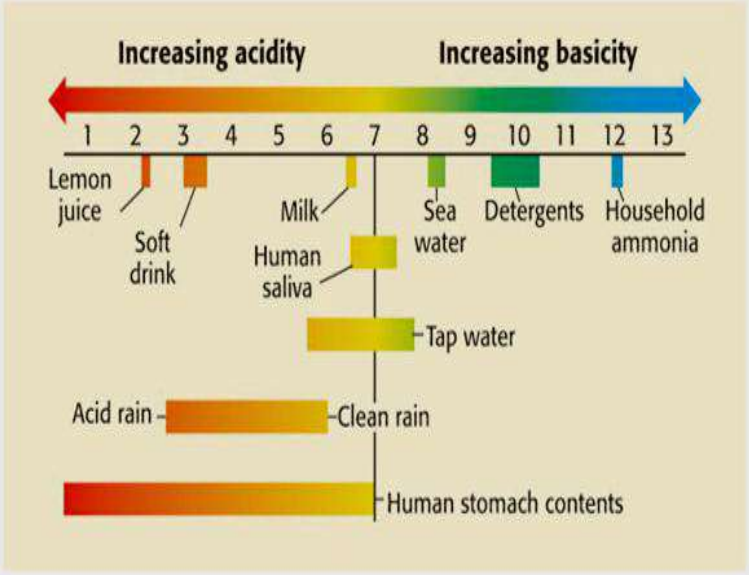
B. **Strong Versus Weak Bases** When all molecules of a base break apart in water to produce hydroxide ions, OH^-, the base is a strong base. When only a few molecules of a base break apart, the base is a weak base.

II. Acids, Bases, and Neutralization

A. The pH Scale The pH of a solution is a measure of the hydronium ion concentration in the solution. The next slide shows the pH values for many common materials.

B. **Using Indicators to Determine pH** A combination of indicators can be used to find out how basic or how acidic a solution is. This can be done if the colors of the indicators are known at different pH values.

C. **pH and the Environment** Living things depend on having a steady pH in their environment.



The term "pH" was first described by Danish biochemist Søren Peter Lauritz Sørensen in 1909. pH is an abbreviation for "power of hydrogen" where "p" is short for the German word for power, *potenz* and H is the element symbol for hydrogen. The H is capitalized because it is standard to capitalize element symbols. The abbreviation also works in French, with *pouvoir hydrogen* translating as "the power of hydrogen".

The pH Scale

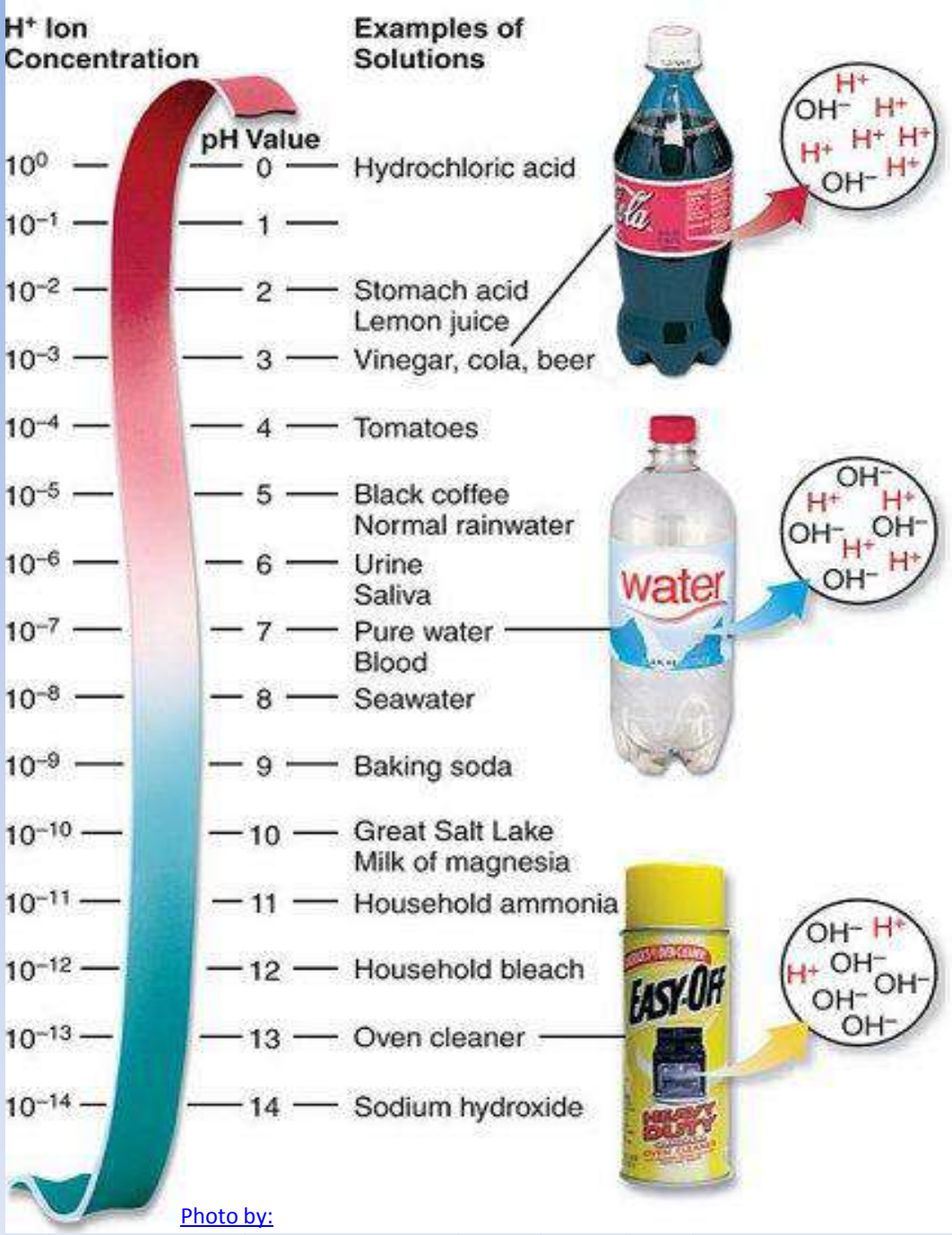


Photo by:
http://academic.cuesta.edu/gbaxley/chem1A/notes/ph_scale_2.jpg

III. Salts

A. What Is a Salt? A salt is an ionic compound formed from the positive ion of a base and the negative ion of an acid.

B. **Uses of Salts** Salts have many uses in industry and in homes. You already know that sodium chloride is used to season foods. It is also used to make other compounds, including lye (sodium hydroxide) and baking soda.

Photo by:
http://www.bestfoodfacts.org/images/thought/salt.jpg