Acids, bases and salts

Environment, Nature

A chemical substance (typically, a corrosive or sour-tasting liquid) that neutralizes alkalis, dissolves some metals, and turns litmus red. Ionic Dissociation: Dissociation in chemistry and biochemistry is a general process in which ionic compounds (complexes, or salts) separate or split into smaller particles, ions, or radicals, usually in a reversible manner. Strength of Acids: The strength of an acid refers to its ability or tendency to lose a proton. There are very few strong acids. A strong acid is one that completely ionizes in water. In contrast a weak acid only partially dissociates.

Examples of strong acids are hydrochloric acid (HCl), hydroiodic acid (HI), hydrobromic acid (HBr), perchloric acid (HClO4), nitric acid (HNO3) and sulfuric acid (H2SO4). In water each of these essentially ionizes 100%. The stronger an acid is, the more easily it loses a proton, H+. Two key factors that contribute to the ease of deprotonation are the polarity of the H—A bond and the size of atom A, which determines the strength of the H—A bond. Acid strengths are also often discussed in terms of the stability of the conjugate base. Sulfonic acids, which are organic oxyacids, are a class of strong acids.

A common example is toluenesulfonic acid (tosylic acid). Unlike sulfuric acid itself, sulfonic acids can be solids. Superacids are acids stronger than 100% sulfuric acid. Examples of superacids arefluoroantimonic acid, magic acid and perchloric acid. Superacids can permanently protonate water to give ionic, crystalline hydronium " salts". Basicity of an Acid: Basicity of an acid refers to the number of replaceable hydrogen atoms in one molecule of the acid. 3 common types of Basicity of an acid Monobasic Definition: 1

molecule produce 1 H+ ion upon dissociation Example: HCl, HNO3 Dissociation Equation: HCl(aq) –> H+(aq) + Cl-(aq)

Dibasic Definition: 1 molecule produce 2 H+ ion upon dissociation Example: H2SO4 Dissociation Equation: Figure it out yourself!! Tribasic Definition: 1 molecule produce 3 H+ ion upon dissociation Example: H3PO4 Dissociation Equation: H3PO4(aq) –> 3H+(aq) + PO4 3-(aq) Alkali: An alkali is a base in an aqueous solution or a chemical compound which is water soluble and neutralizes or effervesces with acids and turns litmus blue; typically, a caustic or corrosive substance of this kind such as lime or soda. Examples of alkalis include NaOH (Sodium Hydroxide), NH3(Ammonia) and KOH (Potassium Hydroxide).

Salt: Any chemical compound formed from the reaction of an acid with a base, with all or part of the hydrogen of the acid replaced by a metal or other cation. Bases: A base in chemistry is a substance that can accept hydrogen ions (protons) or more generally, donate electron pairs. A soluble base is referred to as an alkali if it contains and releases hydroxide ions (OH?) quantitatively. The Bronsted-Lowry theory defines bases as proton(hydrogen ion) acceptors, while the more general Lewis theory defines bases as electron pair donors, allowing other Lewis acids than protons to be included.

Bases can be thought of as the chemical opposite of acids. A reaction between an acid and base is called neutralization. Bases and acids are seen as opposites because the effect of an acid is to increase the hydronium ion (H3O+) concentration in water, whereas bases reduce this concentration. Bases and acids are typically found in aqueous solution forms. Aqueous

solutions of bases react with aqueous solutions of acids to produce water and salts