Chapter 2 - Polar Covalent Bonds; Acids and Bases

Brønsted-Lowry Acids and Bases

Acid base reactions are fundamental processes that are required for the initiation of many organic reactions. Recall some of the definitions from general chemistry.

Brønsted-Lowry Acid - a substance that donates a proton (H⁺).

Brønsted-Lowry Base - A substance that accepts a proton.

Acidity Constant (K_a) - the equilibrium described by a given acid base reaction.

The higher the K_a, the higher the acidity. This is exactly opposite for the pK_a value.

An acid base equilibrium will lie on the side of the weaker acid.

Resonance effects have a large impact on acidity.

Electron negative groups have a small influence on the acidity.
Lewis Acids and Bases

Some acid base interactions cannot be described by proton transfers. Other substances besides proton are electron deficient and can interact with a lone pair of electrons.

**Lewis Acid** - a substance that accepts a pair of electrons (forms a covalent bond).

**Lewis Base** - a substance that donates a pair of electrons.

![Lewis Acid and Lewis Base](image)

Structure Representation

It is critically important to have a method of communicating structural information in an easy and efficient way. Organic chemists represent chemical structures in a variety of different ways.

**Lewis Dot Structures** - all electrons are represented by dots around the atoms. This is tedious.

**Kekulé Structures** - The atoms are drawn and lines represent shared electrons (covalent bonds). We often draw these a little more condensed with the number of H's around the carbons.

**Condensed Structures** - No bonds are shown and side substituents are attached to the carbon before it. This is useful for expressing structures in a written line form, but is a little difficult to read.

**Skeletal Line Structures** - This is the easiest and most efficient method for representing organic molecules. Carbons and Hydrogens are not show. Each end of a line and intersection between lines represents a carbon atom. All other atoms are shown. The number of hydrogens is implied based on the number of other bonds to the carbons (to make up a total of 4 bonds). Hydrogens on other atoms besides carbon are indicated.

3-chloro-3-methylpentane

![3-chloro-3-methylpentane](image)