Ions and Ionic Compounds

Octet Rule-tendency for atoms to attain a noble gas electron arrangement.

- Positive ions form when atoms lose or gain electrons to form octets.
- By losing electrons a metal atom forms an **ion**, which has a positive charge. •
- Negative ions form when non-metal atoms gain one or more valence electrons to attain an • octet. Obtains the same electron arrangement as the nearest noble gas.

Ionic compounds- consist of positive and negative ions. The sum of the ionic charges is always zero.

Naming Ionic Compounds

- The name of a metal ion is the same as its elemental name. The name of a non-metal ion • is obtained by using the first syllable of its elemental name followed by -ide.
- KI: Potassium iodide; MgBr₂: Magnesium bromide •





Neutralizes bases

HCl (g) \rightarrow H⁺ (aq) + Cl⁻

Naming Acids: acids with H and non-metal are named with prefix hydro and end with -ic acid. Acids with H and a polyatomic ion are named by changing the end of name of polyatomic from -ate to ic acid or -ite to ous acid. (ex. ClO_3^- Chlorate \rightarrow Chloric acid)

Arrhenius bases

- Produce OH⁻ ions in water
- Taste bitter or chalky
- Are electrolytes
- Feel soapy and slippery
- Neutralizes acids

An acid, HF, donates H⁺ to form its conjugate base, F⁻. A base, H₂O, accepts H⁺ to form conjugate acid, H_3O^+ .

 $HF + H_2O \rightarrow F + H_3O^+$

Ionization of water

 H^+ is transferred from one H_2O molecule to another. One water molecule acts as an acid, while another acts as a base.

 $H_2O + H_2O \rightarrow H_3O^+ + OH^-$

Ion product of water, Kw

Is the product of the concentrations of the hydronium and hydroxide ions.

 $K_w = [H_3O^+][OH^-]$ [1.0 x 10⁻⁷ M] x [1.0 x 10⁻⁷ M] = 1.0 x 10⁻¹⁴ M

Chapter 14

Esters

Naming: first word indicates the alkyl part of the alcohol. The second word is the carboxylate name of the carboxylic acid. IUPAC: use names for the acid. Common: use the common names for the acid.

O



Derivatives of carboxylic acid in which an amino group (-NH₂) replaces the –OH group.

O I

CH₃-C-NH₂ IUPAC: Ethanamide Common: acetamide

Naming: in both the common and IUPAC names, simple amides are named by dropping the *oic acid* or *ic acid* from the carboxylic acids name and adding the suffix *amide*. An alkyl group attached to the nitrogen of an amide is named with the prefix N-, followed by alkyl name.

NH₂

Benzamide

Amines

Are derivatives of ammonia that contain N attached to one or more alkyl or aromatic groups.

CH₃-NH₂

- Chiral carbon farthest from carbonyl group determines an L or D isomer
- L assigned to left; D assigned to right



Blood Glucose Levels

- Glucose tolerance test measures blood glucose for several fors after ingesting glucose
 accharides
 Two measures

Disaccharides

- Two monosaccharide units on a together
- ✤ Most common haltose, lactose, and sucrose

Maltos + H₂ \rightarrow (H⁺) gluco

Lactose + H₂O \rightarrow (H⁺) glucose + galactose

Sucrose + H₂O \rightarrow (H⁺) glucose + fructose

Maltose

- Obtained from the hydrolysis of starch 0
- Linked by α -1,4- glycosidic bond 0

Lactose

- Found in milk products 0
- Has β 1,4- glycosidic bond 0

Sucrose

- Obtained from sugarcane and sugar beets 0
- Has an α , β 1, 2- glycosidic bond

Amylose