ELECTROLYTES
AN OVERVIEW

I. All electrolytes fall into one of three categories: acid, base or salt.

Acids: molecular substances which undergo ionization in water. They are made up of one or more hydrogen ions + an anion.
Bases: ionic compounds in which the anion is hydroxide, or molecular substances which produce hydroxide ions when placed in water (i.e. NH_3).
Salts: ionic compounds which are not hydroxides.

II. Electrolytes may be either strong or weak. The label "strong" or "weak" indicates the degree to which substances ionize in water. Strong electrolytes are close to 100% ionized in water solution. Weak electrolytes are less than 100% ionized, and thus are examples of equilibria.

A. There are six strong acids: HCl, HBr, HI, HNO_3, H_2SO_4, $HClO_4$. All other acids are weak.
B. The hydroxides of Groups IA and IIA (alkali metals and alkaline earth metals) are strong bases. All other bases are weak.
C. All salts are strong electolytes.

III. In order to determine whether something is a strong, weak, or non-electrolyte, you must be able to place the substance in the appropriate category. Here are some examples:

a. HNO_3: acid (H^+ + nitrate ion), strong electrolyte (from above list)
b. NaOH: base [cation (Na^+) + OH^-], strong electrolyte (Na is alkali metal)
c. H_2CO_3: acid (H^+ + carbonate ion), weak electrolyte (not on list)
d. KI: salt [cation (K^+) and anion (I^-)], strong electrolyte
e. CH_3OH: non-electrolyte. This is not an ionic compound and thus not a base.
f. $Al(OH)_3$: base [cation (Al^{3+}) + hydroxide], weak base
g. $CaCO_3$: salt (cation + anion), strong electrolyte

IV. It would be wise to go back to Chapter 7 and review the names of polyatomic ions.