**Conjugate pairs**

A conjugate pair is an acid-base pair that differs by one proton in their formulas (remember: proton, hydrogen ion, etc.).

A conjugate pair is always one acid and one base. ALWAYS! (OK, you don't have to shout.)

HCl + H2O <===> H3O+ + Cl¯

Here is the one conjugate pair from the first example reaction:

HCl and Cl¯

Usually, HCl is called an acid and Cl¯ is called its conjugate base, but that can be reversed if the context calls for it. So, we can correctly speak of Cl¯ as a base and HCl as its conjugate acid.

Notice that the word conjugate is used with one of the pair and the conjugate is not the primary focus of the context, it is the secondary.

The other conjugate pair is:

H2O and H3O+

Water is the base, since it is minus a proton compared to H3O+, which is the conjugate acid to water.

Remember conjugate pairs differ by only one proton. If you take away the proton (or add it), you get the other formula.

Here are some more conjugate acid-base pairs to look for:

H2O and OH¯

HCO3¯ and CO32¯

H2PO4¯ and HPO42¯

HSO4¯ and SO42¯

NH4+ and NH3

CH3NH3+ and CH3NH2

HC2H3O2 and C2H3O2¯

This last one is special. Because it is used so often, it has an abbreviation:

Acetic acid's (HC2H3O2) abbreviation is HAc and the acetate ion's (C2H3O2¯) is Ac¯.