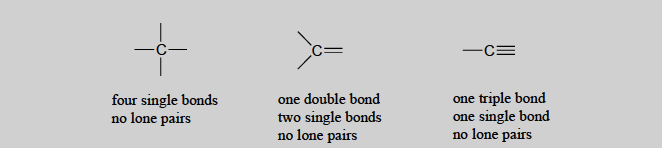
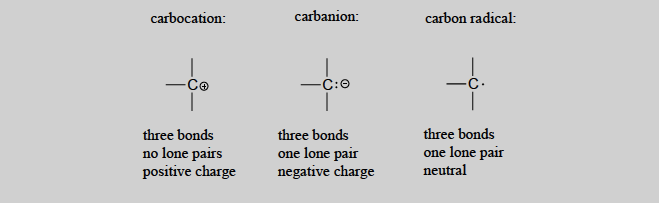
**CHE 2060: Common bonding patterns**

**Carbon:** uncharged bonding patterns

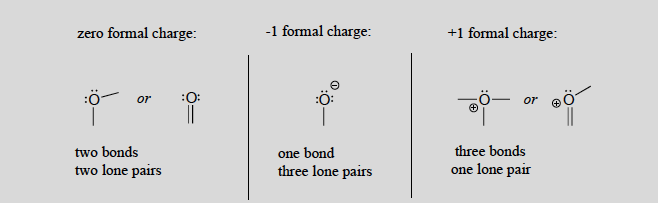
****

**Carbon:** charged, and therefore unstable, bonding patterns



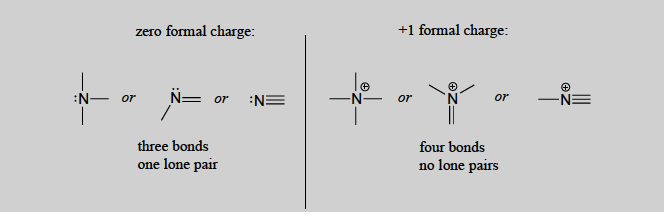
**Hydrogen** forms a single covalent bond, or becomes a hydrogen cation (no electrons) or a hydride anion (one lone pair.

**Oxygen:** bonding patterns



**Sulfur** generally forms the same bonding patterns as oxygen, but can also be hexavalent and form structures that give the sulfur atom more than an octet.

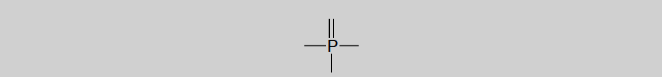
**Nitrogen:** typical bonding patterns



* Nitrogen can also form amide anions, NH2-1, with two lone pairs on the N.

**Phosphorus** typically forms five bonds without a formal charge.

* Usually P bonds to four oxygen atoms.



**Halogens** are the elements found in column 7 of the periodic table.

* These atoms are important tools in organic chemistry labs.
* They are less common in nature.

