

## Determination of Oxidation Number

The sum of the oxidation numbers of the atoms in a neutral molecule is equal to 0.

The sum of the oxidation numbers of the atoms in an ion is equal to the charge of the ion.

1. Atoms of an elemental substance have an oxidation number of 0.
2. Atoms of monoatomic ions have an oxidation number equal to the charge on the ion.
3. The oxidation number of fluorine is -1.
4. The oxidation number of oxygen is -2.\*
5. The oxidation number of hydrogen is +1, except when hydrogen is in combination with metals in binary compounds. When this is true, the oxidation number of hydrogen is -1.
6. The oxidation number of the higher atomic number halogens (chlorine, Cl, Bromine, Br, and iodine, I) is usually -1. See note.

**Note:** When rules are in conflict, the earlier rule prevails. Thus, when chlorine, bromine, or iodine is bonded to oxygen, the halogen will have an oxidation number higher than 0. Furthermore, in an interhalogen compound the halogen with the higher atomic number should be given the higher oxidation number.

\*There are two exceptions to this rule. First, when oxygen atoms in a compound are joined by an -O-O- bond the oxidation number of oxygen is -1. Second, in the compound  $\text{OF}_2$ , the oxidation number of oxygen is +2.