

RULES FOR FINDING OXIDATION NUMBERS USING DOT STRUCTURES

<http://www.csun.edu/~hcchm001/IntroChemHandouts.html>

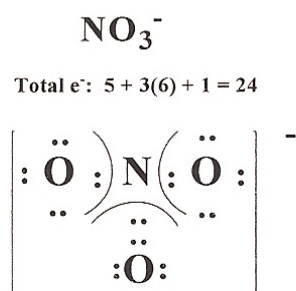
- Write the electron dot structure for the compound or ion.
- Assign electrons in bonds to the more electronegative atom. Circle the more electronegative atom, including in the electrons in the bond with that atom:

$$F > O > N > Cl > Br > I > S > C > H \gg \text{metal ions}$$
- Compare the atom in this "assignment" to the electrically neutral atom.
 - If the atom in the assignment has more electrons than the electrically neutral atom, the atom oxidation number will be negative
 - If the atom in the assignment has fewer electrons than the electrically neutral atom, the atom oxidation number will be positive.
- Sum of oxidation numbers of atoms in a compound = 0
 Sum of oxidation numbers of atoms in a polyatomic ion = charge on the ion

$\# \text{ e- in neutral atom} - \# \text{ e- in assigned atom} = \text{Oxidation Number of Assigned Atom}$

EXAMPLES:

Note: The brackets below are used to assign electrons to the more electronegative atom.



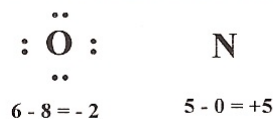
Atoms in the assignment:



Electrically neutral atoms:



Oxidation numbers:

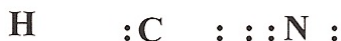


$$3(-2) + 5 = -1$$

charge on the ion



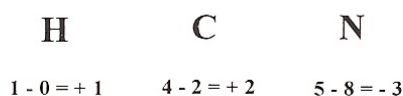
Atoms in the assignment:



Electrically neutral atoms:

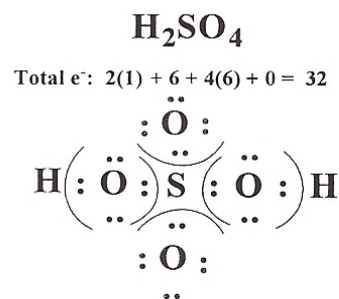


Oxidation numbers:



$$1(+1) + 1(+2) + 1(-3) = 0$$

charge on the molecule



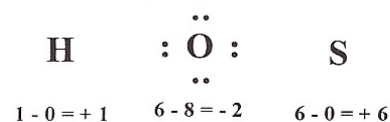
Atoms in the assignment:



Electrically neutral atoms:



Oxidation numbers:



$$2(+1) + 4(-2) + 1(+6) = 0$$

charge on the molecule