Rules for Assigning Oxidation Numbers

Oxidation numbers are real or hypothetical charges on atoms, assigned by the following rules:

1. Atoms in elements are assigned 0.

2. All simple monatomic ions have oxidation numbers equal to their charges. (e.g., all Group IA ions are +1; all group IIA ions are +2; all the following ions have oxidation numbers given by their charges - Fe^{2+}, Al^{3+}, S^{2-}, N^{3-})

3. Fluorine is always -1 in its compounds.

4. Halogens are usually -1, except when a central atom or when combined with a more electronegative element (e.g., assign I as -1 in NI_3, but +3 in ICl_3).

5. Oxygen is -2 in most of its compounds, except in cases like peroxides (H_2O_2, Na_2O_2) where it is -1.

6. Hydrogen is usually +1, except in hydrides with electropositive elements, particularly with metal cations, where it is -1 (e.g., NaH, CaH_2, BH_4^-).

7. The sum of all oxidation numbers for a neutral compound is zero; the sum is the charge on the species for a complex ion.