SYSTEMS OF NAMING COMPOUNDS

Chemical compounds are named according to the International Union of Pure and Applied Chemistry (IUPAC) system. The principles behind this system are better understood with good knowledge of oxidation number of the elements that make up a compound.

Rules of Assigning Oxidation Number

1. The oxidation number of a monoatomic ion is equal in magnitude and sign to its ionic charge. E.g. the oxidation number of Cl^- is -1.
2. The oxidation number of hydrogen in a compound is always +1 except in metal hydrides. E.g. NaH, where it is -1.
3. The oxidation number of oxygen in a compound is always -2 except in peroxide, H_2O_2, where it is -1.
4. The oxidation number of an uncombined element is zero (0).

5. For any neutral compound, the sum of the oxidation numbers of the atoms in the compound must equal zero.
6. For a polymic ion (or radical), the sum of the oxidation numbers must equal the ionic charge of the ion.

Naming Binary Compounds

Binary compounds are made up of two elements. Their names end with –ide except water and ammonia. Example potassium chloride (KCl), hydrogen bromide (HBr), etc. To name these binary compounds, the metal name or the more electropositive element is mentioned first and the more electronegative element mentioned last with the name ending with –ide.

IUPAC Nomenclature System

In this system, for elements with variable oxidation state, their oxidation number is enclosed in a bracket as Roman numeral, e.g. $CuCl_2$ is copper (II) chloride. For elements with fixed oxidation number, e.g. Na, K, Ca, Al, etc., Roman numerals are not used to indicate their oxidation number. For example, $AlCl_3$ is aluminium chloride and not aluminium (III) chloride.