

SECTION 13

NOMENCLATURE OF INORGANIC COMPOUNDS

Inorganic compound: Compounds of elements other than carbon, but including carbon oxides, carbonates.

The Greek and Latin prefixes given in *section 6* also play an important role in inorganic nomenclature.

Definitive rules for naming inorganic compounds have been agreed on internationally, but as these can lead to rather clumsy names many common names for well known compounds remain in use.

Ionic compounds are called **salts** except where the anion is O^{2-} or OH^- in which case the compounds are called **oxides** and **hydroxides** respectively.

Some polyatomic ions have accepted non-systematic names: NH_4^+ , ammonium; H_3O^+ , oxonium (hydronium) (also often just called hydrogen ion in aqueous solutions); OH^- , hydroxide; NH_2^- , amide; CN^- , cyanide.

In nomenclature, polyatomic ions or molecules are often considered to be made up of a positively charged species, (the charge being indicated by an oxidation number), surrounded by **ligands**, (neutral or negatively charged species), which each have a pair of electrons on the atom bonded (**coordinated**) to the central cation. The names for the two common neutral ligands, water and ammonia, are *-aqua*, H_2O , and *-ammine*, NH_3 , respectively. Negatively charged ligands have the ending *-o*. [e.g. Cl^- , *-chloro*; OH^- , *-hydroxo*; O^{2-} , *-oxo*; CN^- , *-cyano*]. (The International Union of Pure and Applied Chemistry is considering changing the ending of simple anion ligands such as chloride to *-ido*. The examples above would be *chlorido*, *hydroxido*, *oxido*, *cyanido*.)

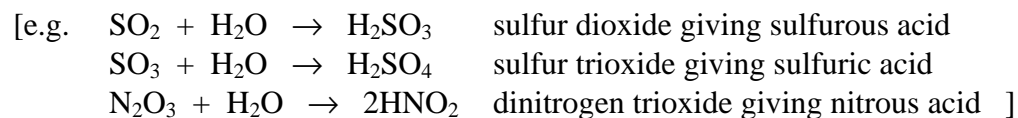
A brief outline of the definitive rules and traditional naming is given below. The examples should clarify the rules.

Systematic naming rules

- 1 The cation has its name unmodified (e.g. the name of the element).
- 2 If the anion is monatomic its name is modified to end in *-ide*.
- 3 If the anion is polyatomic its name is modified to end in *-ate*.
- 4 When oxidation states are to be indicated they are shown by Roman numerals in brackets following the name of the element

KBr	is potassium bromide	rules 1,2
Ca(OH) ₂	is calcium hydroxide	rule 1
NaClO ₃	is sodium trioxochlorate(V)	rules 1,3,4,5
FeCl ₃	is iron trichloride or iron(III) chloride	rules
1,2,4,5		
Cu(NH ₃) ₄ F ₂		

Most of the covalent oxides are named according to the relative number of atoms of the element and oxygens [e.g. SO_2 , sulfur dioxide; SO_3 , sulfur trioxide; N_2O_3 , dinitrogen trioxide]. Oxoacids may be thought of as coming from the hydrolysis of the oxide containing the element in the same oxidation state.



Acid anhydride: The product from removing water from an acid. (**Anhydride**, a substance formed by removing the elements of water from a compound.) [e.g. the oxides in the 6f~~xi~~ide con(3 the elem)]