

mercury(I) cation Hg_2^{2+} , and complexes derived from it, such as $[\text{Hg}_2\text{Cl}_2]$ (Fig. 7.5c). A metal cluster containing CO ligands is illustrated in Fig. 7.5d. More details about *d*-block cage and cluster compounds will be found in Sections 9.9 and 16.10.

Polymetallic complexes contain more than one metal atom and are classified as metal clusters, if they contain M-M bonds, or as cage complexes, if they contain ligand-bridged metal atoms.

7.2 Representative ligands and nomenclature

We outline here a few key ideas of nomenclature and introduce a number of common ligands. More detailed guidance is given in *Further information 1*. We begin by considering complexes that contain only **monodentate ligands**, or 'one-toothed' ligands, that have only one point of attachment to the metal atom, as distinct from **polydentate ligands**, which are 'many-toothed' ligands that have more than one point of attachment.

(a) Nomenclature

Table 7.1 gives the names and formulas of a number of common simple ligands. Table 7.2 gives the Greek prefixes that are used to denote the number of each type of ligand in a complex.

Table 7.1 Typical ligands and their names

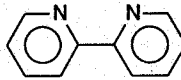
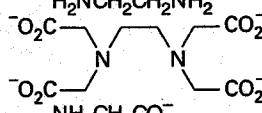
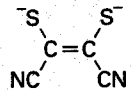
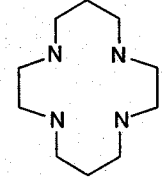
Name	Formula	Abbreviation	Classification
Acetylacetonato	$(\text{CH}_3\text{COCHCOCH}_3)^-$	acac	B(O)
Ammine	NH_3		M(N)
Aqua	OH_2		M(O)
2,2-Bipyridine		bipy	B(N)
Bromo	Br^-		M(Br)
Carbonato	CO_3^{2-}		M(O) or B(O)
Carbonyl	CO		M(C)
Chloro	Cl^-		M(Cl)
Cyano	CN^-		M(C)
Diethylenetriamine	$\text{NH}(\text{C}_2\text{H}_4\text{NH}_2)_2$	dien	T(N)
Ethylenediamine	$\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$	en	B(N)
Ethylenediaminetetraacetato		edta	S(N,O)
Glycinato	$\text{NH}_2\text{CH}_2\text{CO}_2^-$	gly	B(N,O)
Hydrido	H^-		M
Hydroxo	OH^-		M(O)
Maleonitriledithiolato		mnt	B(S)
Nitrioltriacetato	$\text{N}(\text{CH}_2\text{CO}_2^-)_3$	nta	Te(N,O)
Oxo	O^{2-}		M
Oxalato	$\text{C}_2\text{O}_4^{2-}$	ox	B(O)
Nitrito	NO_2^-		M(O)
Tetraazacyclotetradecane		cyclam	Te(N)
Thiocyanato	SCN^-		M(S)
Isothiocyanato	SCN^-		M(N)
2,2',2''-Triaminotriethylamine	$\text{N}(\text{C}_2\text{H}_4\text{NH}_2)_3$	trien	Te(N)

Table 7.2 Prefixes used for naming complexes

Prefix	Meaning
mono-	1
di-, bis-	2
tri-, tris-	3
tetra-, tetrakis-	4
penta-	5
hexa-	6
hepta-	7
octa-	8
nona-	9
deca-	10
undeca-	11
dodeca-	12

*M: monodentate, B: bidentate, T: tridentate, Te: tetradentate, S: sexidentate. The letters in parentheses identify donor atoms.