

28 Ligands and complexes – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)
ligand	_____
dative covalent bond	_____
complex	_____
coordination number	_____

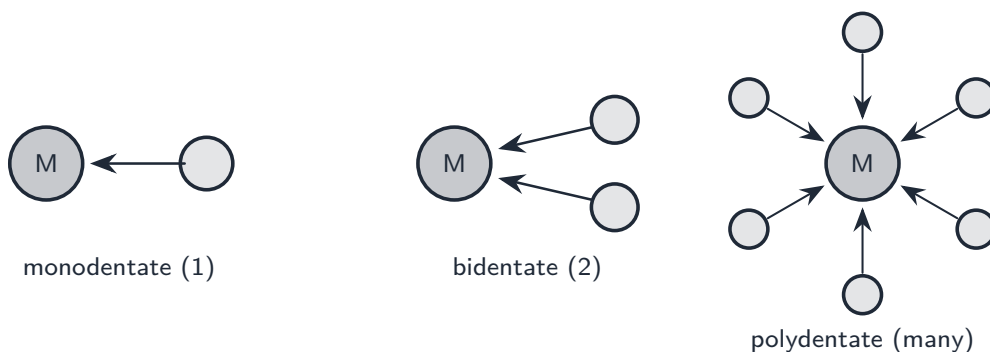
Recall

A transition metal ion can be surrounded by ligands to form a complex.

New ideas

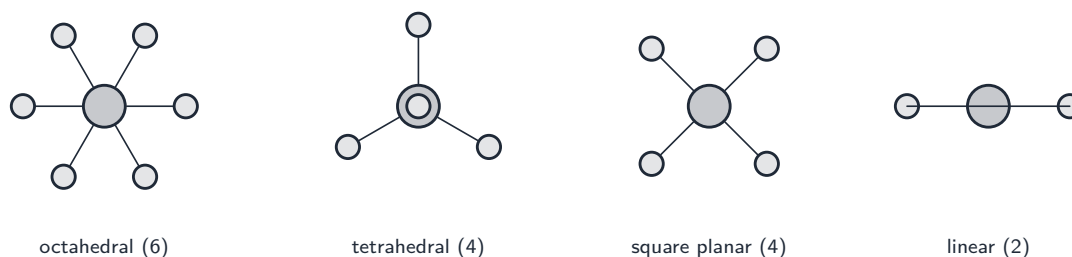
Read these first, then do the Practice.

■ 1 Ligands



A **ligand** has a lone pair that forms a **dative covalent bond** to the metal ion. Ligands are monodentate (one bond), bidentate (two), or polydentate (many).

■ 2 Complex shapes



A **complex** is a central ion surrounded by ligands. The **coordination number** (number of dative bonds) sets the shape: 6 → octahedral, 4 → tetrahedral or square planar, 2 → linear.

Watch out: a ligand bonds by *donating* a lone pair into a dative (coordinate) bond. The coordination number is the number of *dative bonds*, not simply the number of ligands – a bidentate ligand makes *two* bonds.

Practice

Try these in order.

28.6 What is a *ligand*?

[1]

28.7 What type of bond does a ligand form to the metal? [1]

28.8 How many bonds does a *bidentate* ligand form? [1]

28.9 What is the *coordination number*? [1]

28.10 What shape has a coordination number of 6? [1]

28.11 Challenge. A complex has *three bidentate* ligands around one metal ion. State its coordination number and its likely shape. [2]
