Chemistry of transition elements

A-Level Chemistry · Vocabulary in context

Word	Example
transition element /træn'sɪʃn 'elɪmənt/	Iron is a **transition element**.
orbital /'ɔ:bɪtl/	Each **orbital** holds at most two electrons.
oxidation state /ˌɒksɪ'deɪʃn steɪt/	Iron has an **oxidation state** of +3 in Fe2O3. Fe2O3 +3
catalyst /'kætəlɪst/	A **catalyst** speeds up a reaction without being used up.
heterogeneous catalyst /ˌhetrə'dʒi:nɪəs 'kætəlɪst/	Iron is a **heterogeneous catalyst** in the Haber process.
homogeneous catalyst /hə'mɑʊdʒnɪəs 'kætəlɪst/	A **homogeneous catalyst** is in the same phase as the reactants.
complex ion /'kɒmpleks 'aɪɒn/	[Cu(H2O)6]2+ is a **complex ion**. [Cu(H2O)6]2+
ligand /'lɪgænd/	Water is a **ligand** in [Cu(H2O)6]2+. [Cu(H2O)6]2+
dative covalent bond /'dætɪv 'kəʊvələnt bɒnd/	In a **dative covalent bond**, one atom gives both electrons.
lone pair /ləʊn peə/	Water has two **lone pair**s of electrons on its oxygen atom.
monodentate /'mɒnəʊdenteɪt/	Water is a **monodentate** ligand: it forms one bond to the metal.
bidentate /baɪ'denteɪt/	Ethane-1,2-diamine is a **bidentate** ligand: it forms two bonds. -1,2-

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polydentate /ˌpɒlɪ'denteɪt/	EDTA is a **polydentate** ligand: it forms six bonds. EDTA
complex /'kɒmpleks/	Blood contains an iron **complex** called haemoglobin.
linear /'lɪnɪə/	Carbon dioxide is **linear**.
square planar /skweə 'pleɪnə/	Cisplatin is **square planar**.
tetrahedral /ˌtetrə'hi:drəl/	Methane is **tetrahedral**.
octahedral /ˌɒktə'hi:drəl/	SF6 is **octahedral**. SF6
coordination number /kəʊ'ɔ:dɪneɪʃn 'nʌmbə/	[Cu(H2O)6]2+ has a **coordination number** of 6. [Cu(H2O)6]2+ 6
ligand exchange /'lɪgænd eks'tʃeɪndʒ/	In **ligand exchange**, ammonia replaces water around the copper ion.
autocatalysis	In **autocatalysis**, a product speeds up its own reaction.
degenerate /dɪ'dʒenəreɪt/	In a free metal ion, the five d orbitals are **degenerate**: they have the same energy. d
non-degenerate /nɒn dɪ'dʒenəreɪt/	Ligands split the d orbitals into **non-degenerate** levels. d
complementary colour /ˌkɒmplɪ'mentəri 'kʌlə/	The solution absorbs red light, so we see its **complementary colour**, blue-green.
geometrical isomerism /ˌdʒi:əʊ'metrɪkl 'aɪsəmərɪzəm/	But-2-ene shows **geometrical isomerism**. -2-

Word	Example
cis /sɪs/	In **cis** but-2-ene, both methyl groups are on the same side. -2-
trans /trænz/	In **trans** but-2-ene, the methyl groups are on opposite sides. -2-
optical isomerism /'ɒptɪkl 'aɪsəmərɪzəm/	Your left and right hands are like **optical isomerism**: mirror images that do not match.
cisplatin	**Cisplatin** is an anticancer drug.
stability constant /stə'bɪlɪti 'kɒnstənt/	A large **stability constant** means the complex forms easily.

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