5 · Transition Metals and Organic Nitrogen Chemistry

Pearson Edexcel · International A-Level · Chemistry · Vocabulary in context

Word	Example
half-cell /hɑːf sel/	A **half-cell** is one half of an electrochemical cell.
salt bridge /sɒlt brɪdʒ/	A **salt bridge** joins the two half-cells.
standard hydrogen electrode /ˈstændəd ˈhaɪdrədʒɪn ɪˈlektrəʊd/	The **standard hydrogen electrode** has a potential of 0 V. 0 V
standard electrode potential /ˈstændəd ɪˈlektrəʊd pəˈtenʃl/	The **standard electrode potential** of copper is +0.34 V. +0.34 V
reducing agent /rɪˈdjuːsɪŋ ˈeɪdʒənt/	Carbon is a **reducing agent** in a blast furnace.
oxidising agent /ˈɒksɪdaɪzɪŋ ˈeɪdʒənt/	Oxygen is an **oxidising agent**.
disproportionation /ˌdɪsprəˈpɔːʃəneɪʃn/	In **disproportionation**, the same element is oxidised and reduced.
fuel cell /ˈfjuːəl sel/	A **fuel cell** produces electricity while fuel and oxidant are supplied.
transition element /trænˈsɪʃn ˈelɪmənt/	Iron is a **transition element**.
ligand /ˈlɪgænd/	Water is a **ligand** in [Cu(H2O)6]2+. [Cu(H2O)6]2+
complex ion /ˈkɒmpleks ˈaɪɒn/	[Cu(H2O)6]2+ is a **complex ion**. [Cu(H2O)6]2+

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coordination number /kəʊˈɔːdɪneɪʃn ˈnʌmbə/	[Cu(H2O)6]2+ has a **coordination number** of 6. [Cu(H2O)6]2+ 6
bidentate /baɪˈdenteɪt/	Ethanediamine is a **bidentate** ligand: it bonds through two atoms.
monodentate /ˈmɒnəʊdenteɪt/	Water is a **monodentate** ligand: it bonds through one atom.
amine /ˈæmaɪn/	Methylamine is an **amine**.
hexadentate /ˈheksədenteɪt/	EDTA is a **hexadentate** ligand: it bonds through six atoms. EDTA
octahedral /ˌɒktəˈhiːdrəl/	$[Cu(H_2O)_6]^{2+}$ has an **octahedral** shape. $[Cu(H_2O)_6]^{2+}$
tetrahedral /ˌtetrəˈhiːdrəl/	$[CuCl_4]^{2-}$ has a **tetrahedral** shape. $[CuCl_4]^{2-}$
square planar /skweə ˈpleɪnə/	Cisplatin is **square planar**.
ligand exchange /ˈlɪgænd eksˈtʃeɪndʒ/	In **ligand exchange**, ammonia replaces water around the copper ion.
chelate /ˈtʃeleɪt/	A **chelate** grips a metal ion with more than one atom.
amphoteric /ˌæmfəʊˈterɪk/	An **amphoteric** oxide can react with both acids and bases.
autocatalyst /ˌɔːtəʊˈkætəlɪst/	Mn^{2+} is an **autocatalyst**: the product speeds up its own reaction. Mn^{2+}
arene /ˈæreɪn/	Benzene is an **arene**.

Word	Example
delocalised /dɪ'lɒkəlaɪzd/	In benzene, six **delocalised** electrons are shared by all six carbon atoms.
electrophilic substitution /ɪˌlektrəʊ'fɪlɪk ˌsʌbstɪ'tju:ʃn/	Benzene reacts by **electrophilic substitution**.
nitronium /ˌnaɪ'trəʊnɪəm/	The **nitronium** ion, NO_2^+, attacks the benzene ring. NO_2^+
amide /ə'maɪd/	Ethanamide is an **amide**.
aliphatic /ˌælɪ'fætɪk/	Ethylamine is an **aliphatic** amine: it has no benzene ring.
Reflux /'ri:flʌks/	**Reflux** heats a mixture for a long time without losing the vapour.
azo /'ɑ:zəʊ/	An **azo** dye has an –N=N– group. –N=N–
diazonium /ˌdaɪə'zəʊnɪəm/	Keep the **diazonium** salt below 10 °C, or it breaks down. 10 °C
amino acid /ə'mi:nəʊ 'æsɪd/	Glycine is the simplest **amino acid**.
zwitterion /zwɪ'tɪərɪən/	In water, an amino acid exists as a **zwitterion**, with + and − charges. + −
peptide bond /'peptaɪd bɒnd/	A **peptide bond** joins two amino acids.
polyamide /ˌpɒlɪ'eɪmaɪd/	Nylon is a **polyamide**.
Grignard reagent /'grɪgnɑ:d rɪ'eɪdʒənt/	Water destroys a **Grignard reagent**, so keep everything dry.

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Word	Example
extraction /ek'strækʃn/	**Extraction** moves the product from water into an organic solvent.
Recrystallisation /rɪˌkrɪstəlaɪ'zeɪʃn/	**Recrystallisation** uses a little hot solvent to purify a solid.
polydentate /ˌpɒlɪ'denteɪt/	EDTA is a **polydentate** ligand: it bonds through several atoms. EDTA