Chemical bonding

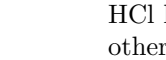
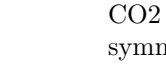
A-Level Chemistry · Vocabulary in context

Word	Example
electronegativity /ɪˌlektrəʊŋgəˈtɪvɪti/	Fluorine has the highest **electronegativity** of all elements.
electron /ɪˈlektrɒn/	An **electron** has a negative charge.
nuclear charge /ˈnjuːklɪə tʃɑːdʒ/	Chlorine has a larger **nuclear charge** than sodium.
atomic radius /əˈtɒmɪk ˈreɪdɪəs/	Sodium has a larger **atomic radius** than chlorine.
shielding /ˈʃiːldɪŋ/	Inner electrons give **shielding**: they block some of the pull of the nucleus.
Pauling electronegativity /ˈpɔːlɪŋ ɪˌlektrəʊŋgəˈtɪvɪti/	On the **Pauling electronegativity** scale, fluorine is 4.0.
ionic bonding /aɪˈɒnɪk ˈbɒndɪŋ/	**Ionic bonding** holds sodium chloride together.
electrostatic attraction /ɪˌlektrəʊˈstætɪk əˈtrækʃn/	**Electrostatic attraction** pulls positive and negative ions together.
ion /ˈaɪɒn/	An **ion** is an atom that has gained or lost electrons.
cation /ˈkætaɪən/	Sodium loses one electron to form a **cation**.
anion /ˈænaɪən/	Chlorine gains one electron to form an **anion**.
lattice /ˈlætɪs/	The ions in salt sit in a regular **lattice**.
metallic bonding /məˈtælɪk ˈbɒndɪŋ/	**Metallic bonding** holds the atoms in a metal together.

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Word	Example
delocalised electrons /dɪ'lɒkəlaɪzd ɪ'lektrɒnz/	**Delocalised electrons** let metals conduct electricity.
covalent bonding /'kəʊvələnt 'bɒndɪŋ/	**Covalent bonding** holds the atoms in a water molecule together.
expand the octet /ek'spænd ðɪ ɒk'tet/	Sulfur can **expand the octet** and have twelve electrons around it.
coordinate bond /kəʊ'ɔ:dɪnət bɒnd/	In NH4+, one N–H bond is a **coordinate bond**. NH4+ N–H
orbital /'ɔ:bɪtl/	Each **orbital** holds at most two electrons.
sigma bond /'sɪgmə bɒnd/	A single bond is a **sigma bond**.
overlap /ˌəʊvə'læp/	The two orbitals **overlap** to form a bond.
pi bond /paɪ bɒnd/	A double bond has one sigma bond and one **pi bond**.
hybridisation /ˌhaɪbrɪdaɪ'zeɪʃn/	In methane, **hybridisation** gives four equal bonds.
bond energy /bɒnd 'enədʒi/	The C–H **bond energy** is about 413 kJ/mol. C–H 413 kJ/mol
bond length /bɒnd leŋθ/	A double bond has a shorter **bond length** than a single bond.
VSEPR theory /'vespə 'θɪəri/	**VSEPR theory** predicts the shape of a molecule.
lone pair /ləʊn peə/	Water has two **lone pair**s of electrons on its oxygen atom.
bonding pair /'bɒndɪŋ peə/	Each **bonding pair** is shared between two atoms.

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Word	Example
bond angle /bɒnd 'æŋgl/	The **bond angle** in water is 104.5°.
linear /'lɪnɪə/	Carbon dioxide is **linear**.
trigonal planar /'trɪgənl 'pleɪnə/	BF3 is **trigonal planar**. 
tetrahedral /ˌtetrə'hi:drəl/	Methane is **tetrahedral**.
pyramidal /pɪ'ræmɪdl/	Ammonia is **pyramidal**.
bent /bent/	Water is a **bent** molecule.
trigonal bipyramidal /'trɪgənl baɪ'pɪrəmɪdl/	PCl5 is **trigonal bipyramidal**. 
octahedral /ˌɒktə'hi:drəl/	SF6 is **octahedral**. 
intermolecular forces /ˌɪntəmə'lekjʊlə 'fɔ:sɪz/	Weak **intermolecular forces** let a gas boil at a low temperature.
molecule /'mɒlɪkju:l/	A water **molecule** has two hydrogen atoms and one oxygen atom.
polarity /pəʊ'lærɪti/	The **polarity** of water helps it dissolve salt.
dipole /'daɪpəʊl/	HCl has a **dipole**: one end is slightly positive, the other slightly negative. 
dipole moment /'daɪpəʊl 'məʊmənt/	CO2 has no **dipole moment** because it is symmetrical. 
van der Waals' forces /'vændɜ: wɑ:lz 'fɔ:sɪz/	**Van der Waals' forces** hold iodine molecules together.

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Word	Example
London dispersion forces /ˈlʌndn dɪˈspɜːʃn ˈfɔːsɪz/	**London dispersion forces** are stronger in larger molecules.
instantaneous dipole /ˌɪnstənˈteɪnɪəs ˈdaɪpəʊl/	Moving electrons can make an **instantaneous dipole**.
induced dipole /ɪnˈdjuːst ˈdaɪpəʊl/	A nearby dipole causes an **induced dipole** in the next molecule.
permanent dipole /ˈpɜːmənənt ˈdaɪpəʊl/	HCl has a **permanent dipole**. HCl
hydrogen bonding /ˈhaɪdrədʒn ˈbɒndɪŋ/	**Hydrogen bonding** gives water a high boiling point.
boiling point /ˈbɔɪlɪŋ pɔɪnt/	The **boiling point** of water is 100 °C. 100 °C
surface tension /ˈsɜːfɪs ˈtenʃn/	**Surface tension** lets an insect walk on water.
dot-and-cross diagram /dɒt ænd krɒs ˈdaɪəgræm/	A **dot-and-cross diagram** shows which electrons came from each atom.

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