Bonding, structure and properties

Answers

GCSE science knowledge recall

This topic online

Q	Answer	Remember
1	ionic	Electrons are transferred from the metal atom to the non-metal atom.
2	covalent	Co- means together: the atoms share electrons.
3	2+	It loses its 2 outer electrons to get a full outer shell.
4	1-	It gains 1 electron to fill its outer shell - non-metal ions are negative.
5	giant lattice	Strong electrostatic forces act in all directions between oppositely charged ions.
6	CaCl2	Two 1- ions are needed to balance one 2+ ion.
7	a pair of electrons	A double bond, like in oxygen O_2, shares two pairs.
8	delocalised	These shared electrons are why metals conduct heat and electricity.
9	condensing	Melting and freezing happen at the melting point; boiling and condensing at the boiling point.
10	spheres	Real particles are not solid, are not all spherical, and do attract each other.
11	aq	The four state symbols are (s), (l), (g) and (aq).
12	When molten the ions are free to move and carry charge, but in the solid they are held in fixed positions in the lattice.	Dissolving in water frees the ions too, so the solution also conducts.
13	intermolecular forces	The covalent bonds inside the molecules stay intact - that is why the boiling points are low.
14	charge	No charged particles free to move means no current.
15	polymers	Polymers are solid at room temperature because the forces between such big molecules are relatively strong.
16	silicon dioxide	Diamond and graphite are the other giant covalent examples to know.
17	slide	Different-sized atoms in an alloy distort the layers so they cannot slide as easily.
18	alloy	Most metals we use are alloys - steel, brass and 9-carat gold.
19	diamond	Diamond does not conduct electricity - it has no delocalised electrons.
20	4	Four strong bonds in every direction make a rigid giant structure.

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Q	Answer	Remember
21	3	The fourth electron from each atom is delocalised, so graphite conducts electricity.
22	It is made of layers with no covalent bonds between them, only weak forces, so the layers can slide over each other.	That is why graphite is used in pencils and as a lubricant.
23	graphene	Very strong and a good conductor - useful in electronics and composites.
24	Buckminsterfullerene	Fullerenes have rings of carbon atoms, usually five, six or seven atoms per ring.
25	nanotubes	Their strength makes them useful for reinforcing materials such as tennis rackets.
26	100	A nanoparticle contains only a few hundred atoms.
27	2500	Coarse particles (dust) are bigger: 2.5 to 10 micrometres.
28	surface area to volume	More surface means smaller quantities are needed - great for catalysts.
29	10	The ratio scales by the same factor the side length shrinks.
30	They might be absorbed through the skin and damage cells, or harm the environment when washed off - the long-term effects are not yet known.	Their benefit is better skin coverage and protection from UV light.

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