

Topic 2

1. Which state changes take place at the a) melting point? b) boiling point	a) Melting and freezing b) Boiling and condensing
2. What is responsible for substances having different melting and boiling points from each other?	The strength of the forces between the particles. Stronger forces = higher melting and boiling points
3. What are the limitations of the simple particle model of states?	There are no forces between particles. All particles are represented by spheres. All the spheres are solid
4. What type of substances does ionic bonding happen between?	Metals and non-metals
5. What is an ionic bond?	An electrostatic force of attraction between oppositely charged ions.
6. What happens to a metal and a non-metal when they form an ionic bond?	The metal loses electrons to become a positive ion. The non-metal gains electrons to become a negative ion.
7. Describe the structure of an ionic compound.	A giant ionic lattice held together by strong electrostatic forces of attraction acting in all directions in the lattice.
8. What are the melting and boiling points of ionic compounds? WHY?	They have high melting and boiling points. Large amounts of energy are needed to break the strong bonds.
9. Ionic compounds WILL NOT conduct electricity when solid but WILL when melted or dissolved in water. Why is this?	When solid, the ions are not free to move. When molten or in solution the ions are free to move and carry the charge.
10. What type of substances does covalent bonding happen between?	Non-metals
11. What happens when a covalent bond is formed?	Atoms share pairs of electrons. This is done so that all electron shells are filled.
12. Describe the structure of a simple covalent molecule.	A small number of atoms held together in molecules by strong covalent bonds.
13. What are the melting and boiling points of simple covalent compounds? WHY?	They have low melting and boiling points. Weak forces between the molecules (intermolecular forces) do not require a lot of energy to overcome.
14. What is the link between molecular size of simple covalent substances and melting and boiling point? Why?	The larger the molecule the higher the melting and boiling point. As the size increases the strength of the intermolecular forces increases
15. Simple covalent molecules WILL NOT conduct electricity, Why is this?	They do not have an overall charge as there are no free electrons.
16. What is a polymer?	Very large molecules formed when many smaller monomers bond together covalently

TOTAL = /25 MARKS GRADE 6: 25 – 20 MARKS GRADE 5: 19 – 15 MARKS
 GRADE 4: 14 – 10 MARKS GRADE 3: 9 – 5 MARKS

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17. Describe the structure of a giant covalent substance.	A large number of atoms covalently bonded together in a huge structure.
18. What are the melting and boiling points of covalent substances? WHY?	Very high melting and boiling points. All of the atoms are held by strong covalent bonds which require a lot of energy to break.
19. Describe the structure and properties of diamond.	Each carbon atom forms 4 covalent bonds with other carbon atoms. Very hard – strong structure. High mpt and bpt – strong bonds. Does not conduct electricity – no free electrons.
20. Describe the structure and properties of graphite.	Each carbon atom forms 3 covalent bonds in hexagonal layers with delocalised electrons between High mpt and bpt – strong bonds. Does conduct electricity – free electrons. Slippery – layers can slide over each other.
21. What is graphene?	A single layer of graphite with properties making it useful for electronics and composites.
22. What are fullerenes?	Molecules of carbon atoms with a hollow shape useful for nanotechnology, electronics and materials.
23. What happens when a metallic bond is formed?	Each metal atom loses its outer shell electrons which become delocalised around the metal cations. The electrostatic forces between the cations and the electrons hold it together.
24. Describe the structure of a metal.	A giant structure of cations in a regular pattern with a cloud of delocalised electrons.
25. Explain the properties of metals.	High mpt and bpt – strong metallic bonds Malleable – layers of atoms which can slide over each other. Good conductors of heat and electricity – delocalised electrons to carry both charge and heat.
26. What are nanoparticles?	Particles between 1 – 100nm in size.
27. What are some uses of nanoparticles?	Sunscreens Self cleaning windows. Cosmetics Antimicrobials
28. What are the possible risks of nanoparticles?	As they are very small they may be ingested or breathed in. They could also effect the environment.