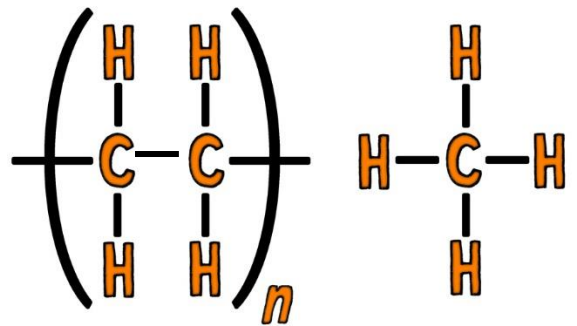
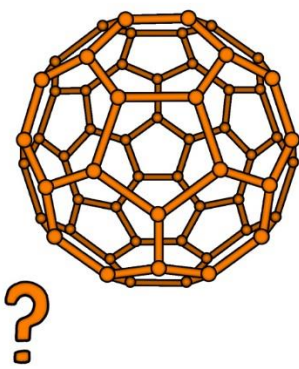


AQA GCSE
BONDING, STRUCTURE AND
THE PROPERTIES OF MATTER
THINKIT!



Cu



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Changes in State:

- Ammonia is a liquid between -77.7°C and -33.3°C . Use the kinetic theory to explain the three states of matter in this case.
- Using the particle theory, predict how temperature and pressure affect the density of a fixed mass of gas.
- *HT only - Explain the limitations of the particle theory.*

Nanoparticle (chemistry only):

- Sun cream uses nanoparticles. In terms of size, evaluate the advantages and disadvantages of using nanoparticles in this way.
- Some scientists believe there should be restrictions on the use of nanoparticles. Explain some of the possible risks associated with the use of nanoparticles.

Metallic bonding:

- Ionic lattices are brittle. Compare and contrast metallic and ionic bonding to explain why metallic compounds are not brittle.
- Explain, in terms of structure and bonding why metals are good conductors of heat energy and electricity.
- Explain why alloying a metal can make the metal harder.

Ionic Bonding:

- Explain, using a diagram, how and why the atoms of Group 1 and Group 7 elements react with each other, in terms of their electronic structure.
- Explain, using their position in the periodic table, what the charges on metallic and non-metallic ions relates to.
- Explain how the ions are held together in solid magnesium oxide (MgO).

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Bonding, Structure and the Properties of matter

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Structure and bonding of carbon:

- Explain the properties of diamond in terms of its structure and bonding.
- Explain how graphite can be used to reduce the friction between two substances.
- Diamond coating would make smartphones and tablets far stronger but would remove their touch-screen capability. Use your knowledge of bonding to explain why.

Ionic Compounds:

- Describe in terms of electrons what happens when magnesium reacts with fluorine to form the ionic compound magnesium fluoride (MgF_2).
- Explain why sodium chloride is NaCl , but sodium oxide is Na_2O .
- Explain why the ball and stick model is not a true representation of the structure of an ionic compound.

Properties of ionic compounds:

- NaCl has a very high melting point, but can be easily crushed. Use your knowledge of bonding to explain this.
- Explain why ionic compounds conduct electricity only when molten or dissolved in water.
- Suggest how electrolysis can be used to separate lead selenide (PbSe).

Covalent Bonding:

- Nitrogen gas is a diatomic molecule. Explain how the atoms are joined together.
- Explain why the melting point of hydrogen chloride is -115°C , whereas sodium chloride's melting point is 801°C .
- Sulphur hexafluoride SF_6 is an insulating gas. Suggest the type of bonding present and explain why it is gaseous at STP (Standard Temperature and Pressure).