

Chemguide – questions

METALLIC STRUCTURES

1.
 - a) Using sodium and magnesium as examples, explain the difference between a 12-co-ordinated structure and an 8-co-ordinated structure. (A simple description is enough. There is no need to draw diagrams.)
 - b) Magnesium has a higher melting and boiling point than sodium. This can be explained in terms of the electronic structures, the packing, and the atomic radii of the two elements. Explain why each of these three things causes the magnesium melting and boiling points to be higher.
2.
 - a) Explain why metals are good conductors of electricity.
 - b) Explain why metals are also good conductors of heat.
3.
 - a) Pure metals are usually *malleable* and *ductile*. Explain what those two words mean.
 - b) If a metal is subjected to a small stress, it will return to its original shape when the stress is removed. However, when it is subjected to a larger stress, it may change shape permanently. Explain, with the help of simple diagrams why there is a different result depending on the size of the stress.
 - c) When a piece of metal is worked by a blacksmith, it is heated to a high temperature in a furnace to make it easier to shape. After working it with a hammer, it needs to be re-heated because it becomes too difficult to work. Explain what is going on in terms of the structure of the metal.
 - d) Why is brass harder than either of its component metals, copper and zinc?