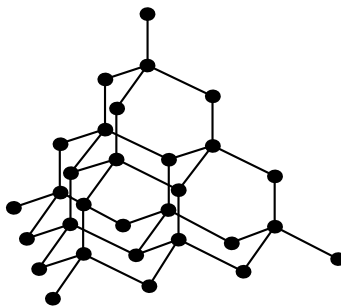


Carbon in the environment sample questions.

13. a) Diamond is a form of carbon. The structure of diamond is shown.



(i) Choose the word which best describes the structure of diamond.

Draw a circle around your chosen answer. [1mark]

giant ionic metallic simple

(ii) Name the type of bonding in diamond. [1mark]

.....

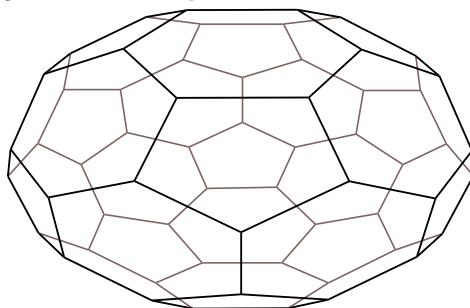
(iii) Give **one** use of diamond. [1mark]

.....

(iv) Deduce the electronic structure of carbon. Use the Periodic Table to help you. [1mark]

.....

14. In 1985 the fullerenes were discovered. They are solid forms of the element carbon. The structure of the C_{60} fullerene is given below.



a) In the C_{60} fullerene, how many other carbon atoms is each carbon atom bonded to? [1mark]

.....

.....

b) Another fullerene has a relative molecular mass of 840.
How many carbon atoms are there in one molecule of this fullerene?
[1mark]

.....

.....

.....

Carbon in the environment sample questions.

c) Fullerenes are soluble in liquid hydrocarbons such as octane. The other solid forms of carbon are insoluble.

Describe how you could obtain crystals of fullerenes from soot which is a mixture of fullerenes and other solid forms of carbon.

.....
.....
.....
.....

d) A mixture of a fullerene and potassium is an excellent conductor of electricity.

(i) Which other form of solid carbon is a good conductor of electricity? [1mark]

.....

(ii) Explain why metals, such as potassium, are good conductors of electricity. [1mark]

.....
.....

(iii) The mixture of fullerene and potassium has to be stored out of contact with air. There are substances in unpolluted air which will react with potassium. Name **two** potassium compounds which could be formed when potassium is exposed to air. [2marks]

..... and

31. A resident of Bufunjo zone fetches water daily from two sources of water: borehole and nearby spring. When she uses this water from these two sources, she realized that she uses a lot of soap while washing her clothes. One day she boiled the water from the borehole for bathing but remembered that she had not washed one of her shirts and washed it with the boiled water instead and used little soap than it used to be. This has forced her to try boiling the spring water as well and used it for washing her clothes but still used a lot of soap as it used to be. This has confused her more. Prepare an article to clear away her dilemma.

(15 marks)