

GRAPHITE

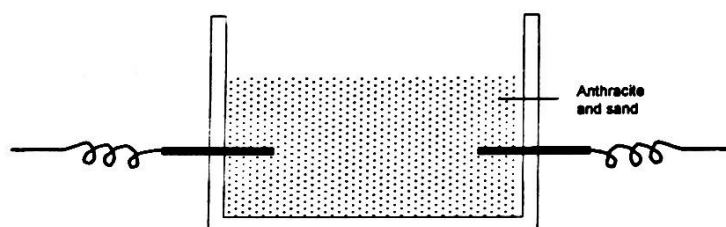
PREPARATION, STRUCTURE AND USES

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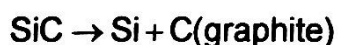
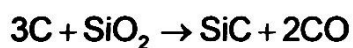
Graphite is made up of carbon atoms only. Graphite is also called *black lead* or *plumbago*. Graphite is widely distributed in different parts of the world. Allege deposits of graphite occur in Ceylon, India, Siberia, Italy, USA, etc.

PREPARATION

A mixture of anthracite (coal) and small amount o sand is taken in an electric furnace. The electric furnace is provided with two carbon electrodes.



When electric current is passed, the temperature rises to about 3000°C. The coal combines with sand to produce silicon carbide (SiC). The carbide decomposes to give carbon in the form of graphite.



STRUCTURE

In graphite, carbon atoms are bonded strongly to one another, only in one plane, not in a three-dimensional pattern as in diamond. Each carbon atom in graphite is covalently bonded to three other carbon atoms to form a two-dimensional network made up of hexagons of carbon atoms. Each unit in the network of hexagons is made of six carbon atoms. A very large number of such units are joined

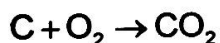
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together in a plane or layer. A large number of these layers stacked together to make the graphite crystal.

The distance between two successive layers is large. Hence, the possibility of formation of covalent bond between atoms, lying in adjacent layers, is ruled out. Thus, the fourth valence electron of each carbon atom remains free. These electrons can easily flow through the body of graphite and hence graphite is a good conductor of electricity. Further, a layer can slip over another layer. This makes graphite soft, and useful as a lubricating agent. Also, the layers set easily deposited on paper because of which graphite is used in pencils.

PROPERTIES

1. Graphite is a good conductor of heat and electricity. This is due to the presence of molecules of mobile electrons in graphite.
2. The melting point of graphite is high.
3. It is a black and soft substance with metallic lustre.
4. When burnt in oxygen, it forms carbon dioxide only.



graphite

This show that graphite is made up of carbon atoms only.

USES

1. Graphite is a good conductor of electricity. Hence, it is used as electrodes in dry cells and in electric arcs.
2. Graphite marks paper. Hence, it is used in pencils and black paints.
3. The melting point of graphite being high, it is used in making crucibles for melting some metals.
4. The lubricating properties of graphite make it a very good lubricating agent especially where other lubricants cannot be used due to high temperatures.
5. Graphite, when heated under very high pressure in the presence of a catalyst, can be transformed into diamond.