

Chapter 4

ENRICHMENT

Use with Section 1

Physical and Chemical Properties

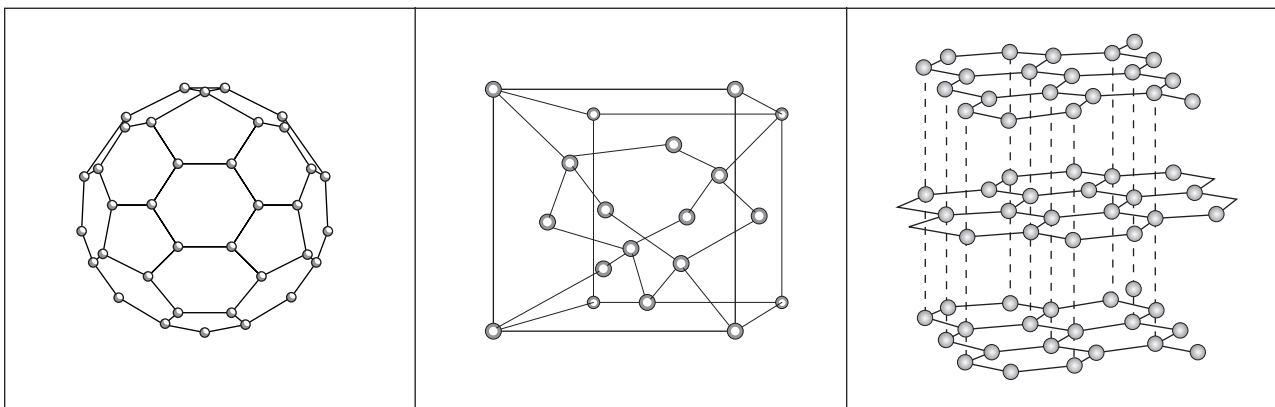
Properties of Carbon

Carbon is one of the most common elements in the world. It forms the tissue of every living creature from an elephant to a spinach leaf. It makes up the products we use to fuel our cars and heat our homes. In one form, it is so soft that it easily rubs off on paper. In another form, it is the hardest natural material known. For years, scientists have explored how the same element can make such very different substances.

One answer is that each carbon atom has four electrons in its outer shell (or orbit). Because the outer shells of most atoms can hold eight electrons, carbon atoms easily form bonds with many other kinds of atoms—including other carbon atoms. However, carbon atoms can bond in several different ways. The drawings below show three different forms of carbon. The circles represent atoms; the lines represent chemical bonds holding the atoms together.

Which properties do you think go with each form of carbon?

Draw a line to the sketch that matches each form. Then on the lines beneath each form of carbon, write the number of the descriptive phrase (from the list below) that fits that form.



Diamond— _____, _____, _____ Graphite— _____, _____, _____ Fullerene— _____, _____, _____

Which of these descriptive phrases goes with which compound?

1. The hardest natural structure
2. A recently discovered type of carbon, also known as “buckyballs”
3. A soft type of carbon that rubs off easily on paper
4. Clear crystal
5. Used in pencil lead
6. Conducts heat and electricity
7. Scientists use it as a “cage” to hold other atoms
8. Used to cut glass and steel
9. Added to lubricants