

优等生跨世纪丛书

林崇德 总主编

高中英语

(下 册)

刘润清 孔蕴华 主 编



中国书籍出版社

The background of the cover is a scenic landscape. In the foreground, there is a vast field of small, light-colored flowers, possibly a meadow. In the middle ground, there are rolling hills or low mountains. In the background, there are higher, more rugged mountains under a clear sky. The overall color palette is dominated by greens, blues, and earthy tones, giving it a natural and serene feel.

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刘润清 孔蕴华 /主 编
陈亚平 /编 著

杜爱军 张杰栋 /插 图

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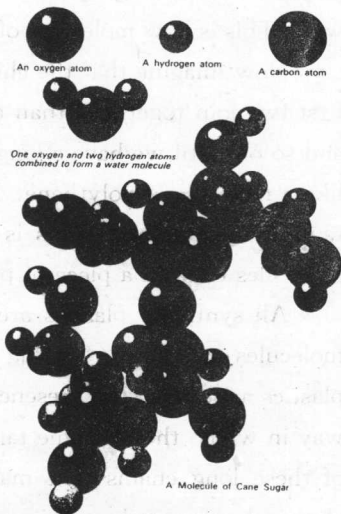
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Unit 23 Plastics

He that seeks finds. — Heywood

Text One Plastics

Many substances which we use today are chemical compounds. Salt is a compound of sodium and chlorine; sugar is a compound of carbon, hydrogen and oxygen. Sodium, chlorine, carbon, hydrogen and oxygen are examples of elements. The smallest particle of an element that can exist is an atom. When two or more atoms are joined together, we call this a molecule. Sugar is one of the larger molecules among common materials.



Carbon atoms have an important chemical property: they can join together to form long chains. Other atoms like

hydrogen, oxygen can be joined to the carbon atoms in such chains to make very large molecules! Most of the plastics we find around us today are compounds made with long chains of carbon atoms.

Let us look at one of the common plastics — polythene, for example. Polythene is a tough, solid material. It is made from a kind of gas called ethylene. A molecule of polythene is made by joining lots of molecules of ethylene together.

Imagine all the children in a school running around in the playground, darting here and there, each going his or her own way. This is how molecules of a gas, such as ethylene, behave.

Now imagine that the children start to link arms together; first two join together, then a third joins them, then a fourth and so on until we have a long chain of children. They are now like a molecule of polythene. Imagine many lines of children all tangled up together. This is a rough picture of the way the molecules exist in a piece of polythene.

All synthetic plastics are made by joining together small molecules to make very big ones. The useful properties of plastics arise from the presence of these large molecules and the way in which they become tangled together. It is the existence of these long chains that makes plastics different from other chemical compounds.

Scientists now understand plastics well enough to be able to say, quite often, how the properties of a particular material can be altered or improved. Whereas years ago, the search for

new plastics was a rather hit-or-miss affair. Today research workers have a fairly good idea of how to set about making a plastic with certain required properties.

Words and Expressions

- plastic/'plæstɪk/n. (常用复数)塑料
sodium/'səʊdʒəm/n. 钠
chlorine/'klɔːrɪn/n. 氯
atom /'ætəm/n. 原子
property /'prɒpəti/n. 性能;特性
polythene/'pɒliθiːn/n. 聚乙烯
ethylene/'eθiliːn/n. 乙烯
dart /dɑːt/vi. 飞奔
link /lɪŋk/vt. 连接
tangle/'tæŋɡl/vi. 缠结
tangle up 缠在一起
synthetic /sɪn'θetɪk/adj. 合成的
alter /'ɔːltə/vt. 改变
search /səːtʃ/n. 探索;寻找
hit-or-miss 尝试
research /rɪ'səːtʃ/n. (科学、学术)研究

Humour

A lot of boys and girls in Western countries are wearing the same kinds of clothes, and many of them have long hair, so it is often difficult to tell whether they are boys or girls.

One day, an old gentleman went for a walk in a park in Washington, and when he was tired he sat down on a bench. A young person was standing on the other side of the pond.

"My goodness!" the old man said to the person who was sitting next to him on the bench. "Do you see that person with the loose pants and long hair? Is it a boy or a girl?"

"A girl," said his neighbor. "She is my daughter."

"Oh!" the old gentleman said quickly. "Please forgive me, I didn't know that you were her mother."

"I'm not," said the other person, "I'm her father."

Text Two

Development of Plastics

Some plastics have been discovered almost by accident. In 1933, some scientists at Winnington, in Cheshire, were looking at the effect of high pressures and temperatures on various materials. A gas, ethylene, was one of these. The ethylene contained a very small amount of oxygen which, it has since been discovered, assists the reaction which turns ethylene into polythene at the temperatures and pressures the scientists were using. After the experiment, traces of a white, waxy solid were found. That was the first small sample of polythene.

It took a few years of work before enough polythene had been made for its properties to be fully investigated, and it was not available in quantity until the Second World War, when it was used widely in radar installations.

During the Second World War, a great amount of research to develop new materials was carried out by the nations involved.

In Germany, the need became acute for materials to replace those such as rubber which were no longer available in that country. This led to the development of synthetic rubbers and several other kinds of plastics. Germany developed a vigorous chemical industry based on coal. The purpose was to produce compounds of carbon and hydrogen that are the

starting materials for making plastics and synthetic rubber.

In Britain it had been hoped that war would be avoided and, therefore, British industry was not so well prepared when the war did break out. However, by 1940, when Germany thought she had won the war, plastics were being used in Britain in increasing quantities. Some of these replaced metals, and thus freed stocks of metal for other uses. Other plastics, used for aircraft cockpits and for insulation in radar sets, played a vital part in helping to win the war.

When the war ended, industry had to readjust itself and find ways of using the large quantities of new materials that factories could produce. During the war there had been a tendency to regard plastics mainly as substitutes for other materials, rather than as new materials with a place of their own in the world. This misunderstanding of plastics continued after the war. The lack of knowledge of the properties of various plastics, together with lack of experience in their use, resulted in many badly-designed articles.

In addition to bad design, there was a lack of knowledge of the best ways to fabricate plastics, and this led to many faulty products. Nowadays, the great majority of plastic articles are carefully designed and made, and they are regarded as new materials which have new uses.