# 科技英语文选与写作

王永东 主编

SCIENTIFIC READING
AND
WRITING IN ENGLISH

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# 内 容 提 要

《科技英语文选与写作》共18个单元，所选文章36篇，写作技巧4个部分穿插其中。每个单元包括课文、词汇、注释、词语学习、练习和阅读文章。练习强调阅读理解和语言词汇的掌握，目的是使读者掌握一定的科技词汇，并能写出较流畅的英语文章。本书可供大中专院校师生和科技工作者参考。

# 前　言

为了使科技工作者和英语爱好者广泛涉猎科技文体，接触科技词汇，扩大知识面，能看懂并写好英语科技文章，我们特编写了《科技英语文选与写作》这本书。

本书的特点是选材范围广，注重将传统的语言点学习与语篇的阅读理解有机地结合起来。该书从宏观角度对课文结构进行分析，通过大量的理解练习帮助读者解决理解方面的困难，提高对科技文章的理解力。同时从微观角度对课文中出现的语言要点，包括对重要句型和难句、词和短语进行例解，并精选了重在实用的相关阅读、词汇、完形填空练习，为读者准确理解并运用这些语言知识打下坚实的基础。同时该书还根据科技英语的特点阐述了科技英语写作的一般技巧。

该书可作为科技工作者的参考读物和大中专院校的科技英语教材，同时对四、六级英语考试应试者也大有裨益。

全书由王永东选材，进行总体设计并统稿。胡桂莲编写第1、3、9、12单元；罗德芬编写第2、14单元；谭福民编写第4、11单元及写作部分；王银屏编写第5、7、8单元；王永东编写第6、10、16、17单元；潘飞南编写第13、15、18单元。

在编写过程中，张梅岗教授不吝赐教，给予了许多指

导和建议，在此一并致谢。由于时间仓促，编者水平与经验有限，书中不妥之处在所难免，希望广大读者批评指正。

编　者

1998年4月

# Contents

# Unit One

Text

## Next to Oxygen

Civilization has long centered around sources of water. Water is necessary to man —— he cannot live without it. Not only is it more important to him than food, but without it he cannot grow crops, run factories, wash himself and his clothes, or keep his home clean.

One of the more serious problems facing us today is that of how to get more water for man to use. We are told that the world's population is literally "exploding". It is expanding at such a rapid rate that scientists predict there will be more people than our planet can house and feed properly. It is estimated that by the year 2000, the population of the world will be double that of 1961.

Nearly three – quarters of the earth's surface is covered with water —— undrinkable water, as far as man is concerned. This water cannot be used by man because of its high mineral content. Of the remaining one – quarter of the earth's surface, at least 60 percent is considered to be arid. In these dry areas water is indeed precious. Very few crops can be grown, and this means that few people

can be supported there.

There are different degrees of water purity. Purity is measured by the amount of impurities in the water. For instance, water is considered to be of high quality and potable if it has no more than 500 parts minerals, or salts, per one million parts of water. Sea water, on the other hand, contains about 35,000 parts per million (ppm). For purposes of irrigation, water can have from 1,000 to 3,000 ppm.

Of course, drinking water represents only a small but important portion of man's needs for water. Americans use an average of 300 gallons a day for their individual needs; this is in addition to that used for agriculture and industry. In areas where water is not plentiful, three gallons a day are considered to be sufficient for man's drinking and culinary needs.

Dual water supplies, though expensive, would help to use available water more efficiently. The purer water could be used only for drinking, and the less pure water for other purposes such as washing and agriculture.

The reason man cannot live on sea water is that the human kidney cannot excrete salts in a concentration of more than about 2 percent. Sea water contains approximately 3.5 percent minerals. This means that for every 100 milliliters of sea water drunk, the kidneys would have to excrete a volume of 175 milliliters of fluid in order to dilute the salt concentration. The additional 75 milliliters of fluid would be drawn from the body's stores of water, in and around the cells. This, in effect, dehydrates the body. People who drink sea water soon become delirious. When this happens, they have become just as dehydrated as a man on a desert without any water at all.

If we could learn to get potable water from sea water, we would be sure of never having a water shortage. In fact, there are a

number of ways in which this has been done.

The processes by which sea water is made usable are of two general kinds. One involves taking the minerals out of the salt solutions; the other involves taking fresh water out of the solution.

Taking the minerals from the saline water is usually done by chemical or electrical methods.

Extracting pure water from the solution can be done in a number of ways. One is by *distillation*, which involves heating the solution until the water evaporates, and then condensing the vapor. Extraction can also be done by partially freezing the salt solution. When this is done the water freezes first, leaving the salts in the remaining unfrozen solution.

A gas such as propane will combine with water molecules in a saline solution to form a solid product, called a hydrate. When this solid is melted (heated) the result is the original propane and pure water.

The main problem with all of these methods lies in the cost of processing. It is the cost of the energy needed to convert sea water to drinking water that is so high. In the United States, fossil fuels, such as coal and oil, and electricity are the main sources of energy. But in underdeveloped countries where fossil fuels do not exist and electricity is an unavailable luxury, other sources must be sought.

The most likely sources of energy in arid regions are the wind and the sun. Wind energy has been used to a limited extent in many countries; machines to use it more effectively are still being developed. However, the amount of wind available varies with the location and the season of the year. Solar energy seems to offer more hope than any other source of energy, particularly since those areas most in need of water lie rather close to the equator and have a relatively clear atmosphere. But better ways of taking advantage of this

inexpensive —— even free —— source of energy need to be found.

Another interesting source of energy is the heat that can be recovered from radioactive waste material. This source is dependable and predictable, but more study and research is still needed in this area.

In addition to the problem of finding an inexpensive form of energy for desalination of sea water, each process seems to present other problems. For instance, when the saline solution is frozen, the salt left in the brine sticks to the ice crystals of water; this makes it necessary to clean the crystals before they are melted. And all distillation that takes place at above 170℉ ~ 190℉ is hampered by the minerals that accumulate on the sides of the containers. This makes heating the solution more difficult and more expensive. It essentially insulates the container against further transfer of heat from the outside.

All of the problems are solvable, given enough time, interested men, and the funds necessary to carry out the research. It is important that they be solved, for as long as men live, water will continue to be what it is today —— next in importance to oxygen.

## New Words

| | | |
|---|---|---|
| literally | ['litərəli] | *ad*. 实际上;确实地 |
| arid | ['ærid] | *a*. 干旱的;贫瘠的 |
| purity | ['pjuəriti] | *n*. 纯净;纯正 |
| impurity | [im'pjuəriti] | *n*. 杂质;不纯 |
| potable | ['pəutəbl] | *a*. 可以喝的;适合饮用的 |
| irrigation | [ˌiri'geiʃən] | *n*. 灌溉;水利 |
| culinary | ['kʌlinəri] | *a*. 烹饪的;烹饪用的 |
| dual | ['dju:əl] | *a*. 双的;双重的 |
| excrete | [eks'kri:t] | *v*. 分泌;排泄 |
| milliliter | ['miliˌli:tə] | *n*. 毫升 |

| | | |
|---|---|---|
| dilute | [daiˈljuːt] | *v*. 冲淡;稀释 |
| cell | [sel] | *n*. 细胞 |
| dehydrate | [diːˈhaidreit] | *v*. 脱水;脱去水分 |
| delirious | [diˈliriəs] | *a*. 神智不清的;极兴奋的 |
| saline | [ˈseilain] | *a*. 盐的;含盐的 |
| distillation | [distiˈleiʃən] | *n*. 蒸馏法;蒸馏液 |
| evaporate | [iˈvæpəreit] | *v*. 蒸发;沉淀;脱水 |
| vapor | [ˈveipə] | *n*. 蒸汽;水蒸气 |
| solution | [səˈluːʃən] | *n*. 溶解液;溶剂 |
| propane | [ˈprəupein] | *n*. 丙烷 |
| hydrate | [ˈhaidreit] | *n*. 水合物 |
| fossil | [ˈfɔsl] | *n*. 化石 |
| radioactive | [ˈreidiəuˈæktiv] | *a*. 放射性的;放射引起的 |
| desalination | [diːsæliˈneiʃən] | *n*. 脱盐 |
| brine | [brain] | *n*. 盐水;盐溶液 |
| hamper | [ˈhæmpə] | *v*. 妨碍;阻碍 |
| accumulate | [əˈkjuːmjuleit] | *v*. 积累;积聚 |
| insulate | [ˈinsjuleit] | *v*. 隔离;绝缘 |
| solvable | [ˈsɔlvəbl] | *a*. 可溶解的 |
| fund | [fʌnd] | *n*. 资金;基金 |

## Notes

1. It's expanding at such a rapid rate that scientists predict that there will be more people than our planet can house and feed properly.

世界人口正以如此快的速度增长,以致于科学家们预言,我们的星球将难以为这么多的人解决食宿问题。

"such …that" 在句中做连词用,意为"这样的(地)… 以致于"。"more … than … can …" 意为"(使)… 难以 …"。又如:

He has taken on more work than he can handle.

他所承担的工作量是他难以完成的。

此外,句中的"house, feed"是转类而来的动词,意为"为 … 提供

住房、食物”。

2. For instance, water is considered to be of high quality and potable if it has no more than 500 parts minerals, or salts, per one million parts of water.
例如，水中所含矿物质或盐不超过百万分之五百，即被认为是高质量的水，可以饮用。
此处，“part”意为“… 分之一”，又如：25 parts per million：百万分之二十五。

3. The reason man cannot live on sea water is that the human kidney cannot excrete salts in a concentration of more than about 2 percent.
人不能靠海水生存是因为人体的肾不能排泄浓度超过约百分之二的盐分。
句中的 “in a concentration of”意为“浓度为”、“浓度是”。

4. For instance, when the saline solution is frozen, the salt left in the brine sticks to the ice crystals of water: this makes it necessary to clean the crystals before they are melted.
例如，盐水溶液结冰后，盐水中的盐分便沾在冰体上，这样一来，必须先清洁冰体，然后才将其融化。

## Word Study

1. involve *vt*.
① 使卷入；连累
Don't involve other people in your mad schemes.
不要使别人卷入到你的疯狂计划中去。
If I were you, I wouldn't get involved in their problems.
我是你的话，我不会卷入他们的纠纷。
②包括；涉及
I didn't realize that so much work was involved in putting on a play.

我没意识到演一出戏会有那么多的工作要做。

He is deeply involved in debt. 他债台高筑。

③ involved *a*. 复杂的;不易懂的

This is an involved sentence that demands careful thinking.

这是个难句,需要仔细想想。

2. concern *vt*.

① 与 … 有关;对 … 重要;影响到

Nuclear pollution has become a worldwide problem that concerns every living thing on this planet.

核污染已成为一个关系到这星球上所有生物的世界性问题。

② be concerned with 牵涉到;与…有关

Einstein's famous equation $E = MC^2$ is concerned with the relationship between energy and mass.

爱因斯坦的著名方程 $E = MC^2$ 涉及到了能量与质量之间的关系。

③ as/so far as…is/are concerned 对…而言;至于;就…而论

Nearly three quarters of the earth's surface is covered with water —— undrinkable water, as far as man is concerned.

几乎四分之三的地球表面是水——对人类而言,是不可饮用的水。

④ concerning *prep*. 关于

Please inform me concerning this matter.

请把有关这件事的情况告诉我。

3. volume *n*.

① 音量;响度

The television is too loud; turn the volume down.

电视机声音太大了,把音量关小点。

Your radio has a volume control.

你的收音机有音量控制装置。

② 容积;容量;体积

The volume of this container is 1000,000 cubic meters.

这个集装箱的容积为 100 万立方米。

③ 卷;册

We have a set of Dickens' works in 24 volumes.

我们有一套二十四册的狄更斯全集。

The library contains 20,000 volumes. 该图书馆藏书有两万册。

④ 大量;许多

Volumes of black smoke belched out from the chimneys.

大量的黑烟从烟囱冒出。

His donations to charity speak volumes for his generosity.

他对慈善事业的捐助充分体现了他的慷慨。

## Exercises

### I. Understanding the text:

1. Sixty percent of _____ of the earth's surface is arid land.
   a. three quarters　　b. one quarter
   c. one half　　d. three eighths
2. The main problem concerning the present methods of extracting usable water from sea water is _____.
   a. the lack of equipment　　b. the shortage of labor
   c. the cost of processing　　d. the lack of electricity
3. Man cannot drink sea water because _____.
   a. the oxygen content is too low
   b. it contains harmful bacteria
   c. the mineral concentration is too high
   d. it evaporates very rapidly
4. Distillation involves heating the solution and then _____.
   a. freezing it　　b. liquidizing the vapor
   c. applying chemicals to it　　d. adding propane
5. The most likely sources of energy in arid areas are _____.
   a. fossil fuels　　b. coal and oil

c. the radioactive materials d. the wind and the sun

**Ⅱ. Fill in the blanks with words and expressions given below:**

involve, not only…but also, represent, in effect, concern, expand, next to, lie in, volume, an average of

1. The fundamental cause of the development of a thing _____ its internal contradictoriness.
2. The _____ of transport has to be greatly increased during the months from December to March.
3. The car was dashing forward at _____ 75 miles an hour that day.
4. The red lines on the map _____ railways and the black lines indicate rivers.
5. Which is the town _____ London in size?
6. Don't trouble yourself about things that don't _____ you.
7. He _____ said it _____ did it.
8. Iron _____ when it is heated.
9. Their refusal was _____ a heavy blow to us.
10. This job _____ traveling abroad for 3 months each year.

**Ⅲ. Choose the one closest in meaning to the underlined parts:**

1. Sea water is potable only after it has been properly processed.
   a. sweet b. drinkable c. edible d. poisonous
2. Baking cakes is nothing difficult to Tom, since he has studied the culinary art.
   a. cooking b. dressing c. ironing d. frying
3. This factory has expanded to twice its original size.
   a. stretched b. increased c. amounted d. prolonged
4. However, the amount of wind available varies with the location and the season of the year.