科技英语通俗读物

中级科学英语选读

高耘田编

商务印書館

中級科学英语选读

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內 容 提 要

本书是一本供高等学校理、工、农、医各专业学生和研究生以及科技工作者学习科技英語的自学讀物。內容的深度大致与《初級科学英語选讀》銜接。选材的范围包括物理、化学、生物、宇宙航行、农业和科学研究方法等部門，本书絕大部分单詞都是各专业英語书籍所通用的。选文共有 10 篇，分为 27 課；材料的編排尽可能作到循序漸进，由浅入深。凡是难解的句子、成語、术語、专門名詞以及习慣用法等，都尽可能附譯汉語或加注释。注释中还注意到科学上用的某些单詞的詞源和讀音、科学用語的特殊涵义以及同义語的辨析。

科技英語通俗讀物

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高耘田編

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前　言

自从党的十一届三中全会以来，随着改革开放政策的实行，我国与世界各国间的交往发展迅速，科技、教育领域的国际学术交流也日益频繁，对于我国吸收世界各国的先进经验、促进四化建设，起到了重要作用。

国际学术交流有多种形式，如学者互访、考察、讲学等，但通过国际性学术会议进行交流，仍然是影响最广的一种主要形式。近几年来中国学者积极参加在世界各地召开的各种国际学术会议，中国也主办了不少国际性的学术会议。可以预见，随着我国对外开放政策的进一步实施，随着我国社会主义建设事业的进一步发展和我国国际地位的进一步提高，将会有越来越多的中国学者活跃在国际性学术会议的讲坛上，由我国主持召开的国际性学术会议也将一天比一天增多。

然而在进行国际性学术交流中还存在一个巨大的障碍——语言问题。语言在国际交流中的重要性是不言而喻的，在国际性学术会议上进行交流，这个问题更为突出。它涉及一整套适应会议交流形式的惯用语，如演讲、讨论、主持会议等场合中使用的语言。不少人虽然掌握了各自专业的技术词汇，也熟悉日常生活用语，但在这些场合中却感到语言贫乏，词不达意，严重地妨碍了与外国同行间的交流。

其实这类用语并不深奥复杂，但在一般教科书中却找不

到，在报章、杂志上也很少见，迄今为止，在国内还没有见到过一本这方面的工具书。

在当今国际交流中，英语事实上已经起了“世界语”的作用。编者根据实践中积累的资料，参考国外有关文献，特编成此书，希望能对促进我国学术界参加国际学术交流有所帮助。

本书以实用性为主要方针，共分两部分：第一部分是参加国际性学术会议，作学术演讲、进行学术讨论等场合的用语。第二部分是主持国际性学术会议时各种场合中的用语。在这一部分中还包括了与会务有关的一些用语，如通知、日程、议事等。至于会议期间的食、宿、旅行以及宴会、观光等非学术活动中的用语，均属一般生活用语，不包括在本书范围之内。

在英语中，对同一表述内容，可以有很多词汇及句型来表述。本书中也尽量列出各种可供选用的例句。当然这也远非全部。读者可以举一反三，根据场合和需要将各种词汇或句型加以组合，灵活运用。所有例句均有中文对照。

本书虽然是为学术性会议而编，但其基本内容也适用于非学术性会议。

由于编者水平所限，错误之处在所难免，敬希广大读者随时指正。

谢启文

一九八八年四月于沈阳

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本书语法用语略语表

adj.=adjective
adv.=adverb
n.=noun
phr.=phrase
pl.=plural
p.p.=past participle
pref.=prefix
prep.=preposition
pres.p.=present participle
pro.=pronoun
suf.=suffix
v.i.=intransitive verb
v.t.=transitive verb

前　言

自从党的十一届三中全会以来，随着改革开放政策的实行，我国与世界各国间的交往发展迅速，科技、教育领域的国际学术交流也日益频繁，对于我国吸收世界各国的先进经验、促进四化建设，起到了重要作用。

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一九八八年四月于沈阳

1. SYNTHETIC METALS TO ORDER

"Too soft!" "Too Weak!" "Too brittle!" "They'll never take the place of forgings and castings!"

Those were some of the remarks that greeted powder metal products such as small gears and oilless bearings when they first appeared.[1] But times have changed and so has the acceptance of powder metallurgy.[2] No longer are powder metal products called "metal cookies"[3] and dismissed as too soft, too weak, or too brittle. Powder metallurgy is as respected today as the older metal-forming methods:[4] forging, casting and rolling. Engineers have found they can get qualities with powder metals that they can't get any other way.

One group of powder metals is helping to cut the cost of future automobiles, refrigerators, washing machines and countless other items. This group comprises the superhard "carbide metals". They are true synthetic metals. Some of them are heavier than lead. They are twice as stiff as steel, nearly as hard as diamond; it is almost impossible to wear them out, and they retain their hardness at extreme heat.

Another important characteristic of carbide metals is that they excel both as "tool metals" and as "use metals". As tool metals, the carbides are today cutting things which all of us will be buying tomorrow. Cemented carbide cutting tools and shaping, drawing and forming dies[5] are considered essential by industry today for low cost mass production of automobiles, refrigerators,

radios, pots, pans, coffee percolators, pressure cookers and a host of other necessities and luxuries.

Produced only by powder metallurgy,[6] metallic carbides are the hardest metals ever made in quantities by man. They are so hard that projectiles made of them pierced the heaviest German armor plate—armor plate from which the hardest of steel shells bounced off. Carbide tools also hewed out guns, tanks, ships and planes at a higher speed and a lower cost than would have been possible with steel tools.[7]

The hard carbide metals themselves are not really new, although most of their uses are.[8] Back in 1896 a French chemist, Moissan, accidentally produced particles of tungsten carbide while he was trying to create a temperature equal to that of the sun[9] in his newly invented electric furnace. Moissan tossed the hard carbide particles aside as worthless and grieved because he had not rivaled the sun.

The first commercial use of tungsten carbide came during World War 1 when the hard-pressed German industry hit upon the idea of "cementing" together the individual hard particles. The resultant blocks of solid metal were used as substitutes for the diamond dies so badly needed at that time for drawing filament wire to be used in electric light bulbs. It was lucky for the Allies[10] that the Germans didn't learn at that time how to make carbide tools for cutting metals. If they had learned that trick, Armistice Day might have been postponed.[11]

The manner in which the hard metal carbides are

made may be illustrated by ordinary tungsten carbide, a grade widely used for cutting tools.[12] The base metal,[13] tungsten, and lampblack—both powdered as fine as flour[14]—are mixed and heated to a high temperature in an atmosphere of pure hydrogen. The material that comes from the furnace is powdered tungsten carbide. Each particle is extremely hard but so small that if all the particles in just one pound of tungsten carbide were bricks, there would be enough to build a wall 1000 feet high and 200 feet wide across the United States.

This powdered metal is mixed with a "binder"—usually powdered cobalt or nickel. The resulting mixture is then molded into the desired shape under pressure. These shapes are "sintered", or heated, at about 2650 degrees F.[15] The material comes out of the sintering furnace in its final hardened form—so hard it will easily scratch the hardest file.[16]

Structurally, a piece of carbide metal might be compared to a brick wall. The bricks are the tiny pieces of hard metal carbide. The cobalt or nickel is the mortar or binding material which cements the hard particles together to form one compact piece of metal. Carbide metals can be made so dense that X-rays have trouble penetrating even relatively thin sections.

At present, the greatest single use of the hard metal carbides is still as a tool metal. However, carbide metal forms only the cutting tips of such tools. A small tip or blank of carbide is brazed or otherwise fastened onto the end of a tough, inexpensive steel shank. The retention of hardness at high temperatures has caused

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carbide to replace high-speed steel and other steels as a cutting tool metal in both industry and the home workshop. In addition to metals, nonmetallics such as glass, wood, stone, plaster and plastics are being drilled, milled and otherwise machined with these hardest of all tools.

Carbide tools not only last from four to hundreds of times as long as steel tools,[17] but they cut many times faster. Thus carbide tools make it possible for the worker to increase his production per hour with less work, since he doesn't have to keep sharpening and resetting his tools.[18] Also, carbides can cut materials that are tougher and stronger than ordinary steel. For instance, armor plate and even some modern automobile pistons and brake drums—which are so hard or tough that they quickly turn or dull the edges of high-speed steel tools[19]—are easily machined with carbides.

Despite the records made by cemented carbides as a cutting tool metal, future applications may involve the supplanting of steel, bronze and other common metals by carbides in all kinds of products which are exposed to rubbing and abrasion.[20]

Hard metal carbides have been used for a number of years to make dies for drawing steel bars and rods into wire.[21] In these dies, the carbide metal is used to form the inner bearing surfaces of the die—that part which bears the entire brunt of the wear caused by the drawing process.[22] Today, carbide dies are considered standard equipment[23] in the wire drawing industry. Their use made possible what is known as the continuous

wire-drawing process.[24]

Undoubtedly, the use of carbide metals for tools and dies will continue to increase under conditions of peacetime competition, since carbide equipment not only cuts costs of operations drastically but also helps lighten the load on the workers. Moreover, mass production of carbides has so greatly lowered their cost that today the hard metal industry seems to be standing upon a new threshold.[25] It is a threshold which the industry is facing with restraint—for it leads into those fantastic realms of new ideas for consumer goods.[26]

The men who make hard metal carbides are hesitant about predicting the extent to which these synthetic metals may be used in consumer items.[27] They recognize that carbides have other exciting characteristics besides their unequaled hardness and tremendous resistance to wear. It is possible that the extreme density and weight of the carbides may suggest future uses. Or it may happen that carbide's stiffness—which is twice that of steel[28]—together with carbide's resistance to crushing loads—which is higher than that of any other known metal—may result in uses now undreamed of. Other developments may center around the revolutionary characteristics of carbides as bearing materials.

Meanwhile, the fabricators of consumer goods are already beginning to use the hard metal carbides. The appeal of everyday items which will last "almost forever"[29] because of carbide's ability to withstand wear is too strong to resist.

Right now, the hard metal carbides seem to be a

promise of a new climax to man's age-old hunt for "hardness". Ever since the day when man first lashed a sharp flint to a stick and used it for splitting firewood—and the skulls of his enemies—he has striven to develop harder and ever harder materials from which to fashion better things.

Copper. Bronze. Iron. Steel. To that list we can now add: hard metal carbides.

(From *Popular Mechanics*)

詞　汇

abrasion [ə'breiʒən] *n.* 磨損
acceptance [ək'septəns] *n.* 接受
appeal [ə'pi:l] *n.* 吸引力
base [beis] *n.* 基础，基底（参閱本文注释 13）
binder ['baində] *n.* 粘結剂
blank *n.* 毛坯
braze *v.t.* 用銅焊
brittle *adj.* 脆的
carbide *n.* 碳化物
　c. metal 碳化金属
casting ['kɑ:stiŋ] *n.* 鑄件
cemented [si'mentid] *adj.* 熔結的
center *v.i.* 集中
characteristic [kæriktə'ristik] *n.* 特征
climax ['klaimæks] *n.* 頂点
cobalt ['koubɔ:lt] *n.* 鈷
coffee percolator [—'pə:kəleitə] 咖啡壺
comprise [kəm'praiz] *v.t.* 包含
consumer *n.* 消費者
　c. goods 消費品
cookie ['ku:ki] *n.* 小甜餅
cost of operation 运轉成本，操作成本
crushing loads 沉重的負荷
diamond ['daiəmənd] *n.* 钻石
　d. dies 钻石模
die [dai] *n.* (拉絲) 模，鑄模
excel [ek'sel] *v.t.* 超过
fabricator ['fæbrikeitə] *n.* 制造者
fashion ['fæʃən] *v.t.* 制成...形式
filament ['filəmənt] *n.* 細絲
　f. wire 灯絲
file [fail] *n.* 銼
flint *n.* 火石
forging ['fɔ:dʒiŋ] *n.* 鍛件
grieve [gri:v] *v.t.* 难过
hard-pressed *adj.* 受重大压力的，压得喘不过气来
hesitant ['hezitənt] *adj.* 躊躇
hew [hju:] *v.t.* 削，砍
inexpensive *adj.* 便宜的，不貴的
item ['aitəm] *n.* 項目
lampblack *n.* 灯黑
lash *v.t.* 用繩縛住
last *v.i.* 經用时間，經用
luxury ['lʌkʃəri] *n.* 奢侈品

machine [mə'ʃi:n] *v.t.* 切削加工
metallurgy ['metələdʒi] *n.* 冶金术
mill *v.t.* 銑
mold (=mould) *v.t.* 用鑄模做成
mortar ['mɔ:tə] *n.* 灰泥
nickel ['nikəl] *n.* 鎳
nonmetallics ['nɔnmi'tælikɔ] *n.* 非金属类
pan *n.* 平底鍋 (炒菜或作餅用)
pot *n.* 罐, 壺
pressure cooker ['preʃə —] 压力蒸鍋
process ['prɔses] *n.* 程序
projectile [prə'dʒektail] *n.* 炮弹, 投射物
promise ['prɔmis] *n.* 未来的希望
quality *n.* 优质的产品
refrigerator [ri'fridʒəreitə] *n.* 电冰箱, 冷冻机
remark *n.* 評語
resistance [ri'zistəns] *n.* 抵抗力
restraint *n.* 克制, 拘束
resultant [ri'zʌltənt] *adj.* 結果的
retention *n.* 保留
rival ['raivəl] *v.t.* 賽过
rolling *n.* 輾軋, 軋延
scratch [skrætʃ] *v.t.* 刮坏
section *n.* 截面, 断面
shank *n.* 柄
sinter *v.t.* 烧結
skull *n.* 腦壳
strive *v.i.* **(strove, striven)** 努力爭取
substitute *n.* 代用品
synthetic [sin'θetik] *adj.* 合成的
threshold ['θreʃould] *n.* 門檻
toss *v.t.* 投掷, 扔
tough [tʌf] *adj.* 坚靱的
tungsten ['tʌŋstən] *n.* 鎢
t. carbide 碳化鎢
washing machine 洗衣机

短　語

to order 定做的, 照規格計划做的 (前置詞短語, 修飾 metals)
take the place of 代替
wear ... out 磨坏, 消磨掉
a host of 許多, 一大群
not only ... but 不仅...而且
exposed to 易于遭受
bear the brunt of 首当其冲, 承受...主要負担
lighten the load on... 减輕...的負担
with restraint 带着克制的态度, 不随便表示意見
hesitant about 对...表示犹豫
undreamed of 做梦都想不到的 (过去分詞作定語用, 修飾 uses)
center around 集中于..., 以...为中心
too strong to resist 太强以致无法抵抗 (=so strong that it can not be resisted)

課文注釋

1. when they first appeared, 状語从句, 修飾前面从句的謂語 greeted.
2. so has the acceptance of powder metallurgy=the acceptance of

powder metallurgy has changed also: 因此对于粉末冶金术的授受問題也有所改变.

3. No longer are powder metal products called "metal cookies". 否定詞 no longer 放在句首是为了加重語气; 当否定詞放在句首时, 句子的語序一般倒装.
4. Powder metallurgy is as respected today as the older metal-forming methods: 現在粉末冶金术和以前的冶金方法同样受重視.
5. cemented carbide cutting tools and shaping, drawing and forming dies: 熔結碳化物切削工具以及熔結碳化物成型、拔絲和精整模. cemented carbide 作定語, 修飾 cutting tools, 同时也修飾 shaping dies, drawing dies 和 forming dies.
6. produced only by powder metallurgy: 只有用粉末冶金术来生产的.
7. at a higher speed and a lower cost than (they) would have been possible with steel tools: 比鋼质工具所能达到的速度高, 成本低. would have been 是虛拟語气, 表示不曾发生过的事情.
8. although most of their uses are=although most of their uses are new.
9. that of the sun 中的 that 是指示代詞, 代替 temperature.
10. the Allies: 盟国, 指第一次欧战中的协約国.
11. If they had learned that trick, Armistice Day might have been postponed: 如果他們学会了那一手, 第一次欧战停战日(1918年11月11日)可能会推迟. 全句为虛拟語气結构, 表示过去并未发生的事情.
12. a grade widely used for cutting tools: 一种广泛用来作切削工具的品級. a grade 作 tungsten carbide 的同位語.
13. base: 在这里 該詞 是名詞, 作"基础、基底"解, 作定語用. base metal 是"基底金属", 指在合金中的基本金属. 但 base metal 又有另外一个意义, 即"賤金属", 指錫、鉛一类在性能上較次的金属. 在后一意义时, base 是形容詞, 作"低下、卑賤、质次"解.
14. both powdered as fine as flour [flauə]: 是一个用破折号分开的插入語, 补充說明 tungsten 和 lampblack.
15. 2650 degrees F.: 华氏 2650 度. F. 为 Fahrenheit 之略.
16. so hard it will easily scratch the hardest file=so hard that it will ...: 非常坚硬, 能够輕易地把最坚硬的鉗刮坏.
17. from four to hundreds of times as long as steel tools: 比鋼质工具經用四倍到几百倍.
18. since he doesn't have to keep sharpening and resetting his tools: 因为他不需要不断地磨銳或重新按装他的工具. sharpening 和 resetting

是并列的动名詞，作 keep 的賓語.

19. they quickly turn or dull the edges of high-speed steel tools. 它們很快就使高速鋼的工具卷边或变鈍.
20. the supplanting of steel, bronze and other common metals by carbides in all kinds of products which are exposed to rubbing and abrasion: 用碳化金属来代替一切易于磨損的产品中的鋼、青銅和其他普通金属.
21. to make dies for drawing steel bars and rods into wire: 制造拉絲模，把鋼条和鋼棍拉成絲.
22. that part which bears the entire brunt of the wear caused by the drawing process: 担当拉絲过程所造成的全部磨損的那个部分. that part 是 the inner bearing surfaces of the die 的同位語.
23. carbide dies are considered standard equipment: 碳化拉絲模被当作标准設备. standard equipment 在这里用作謂語 are considered 的补足語.
24. Their use made possible what is known as the continuous wire-drawing process: possible 是賓語从句 what ... process 的补足語.
25. to be standing upon a new threshold: 站在一个新的門檻上；就要迈进一个新的时代.
26. for it leads into those fantastic realms of new ideas for consumer goods: 因为它引进了关于消費品的超乎想象的新概念領域.
27. the extent to which these synthetic metals may be used in consumer items: 这些合成金属在消費品中可能使用的范围. to which 后面是定語从句，修飾 extent. to 是前置詞，与 extent 連用.
28. which is twice that of steel: 有鋼的硬度两倍大. that = stiffness.
29. The appeal of everyday items which will last "almost forever": "几乎永远"耐用的日用品的吸引力.

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