

石油英语系列教材

石油地质 实用英语

解曙巍 主编

上册

PRACTICAL ENGLISH
OF
PETROLEUM GEOLOGY

石油大学出版社

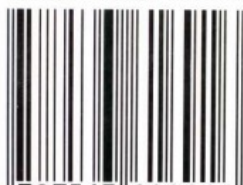
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OF
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责任编辑：何 峰

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策 划: 江兴林 朱仁宏 解曙巍

责任编辑: 何 峰 (电话 0546-8392565)

封面设计: 孟卫东 (电话 0546-8521512)

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内 容 提 要

石油地质专业英语教材

该书是一套石油地质专业方面的实用英语教材。全书分上、下两册。上册课文内容以油气生成、运移、聚集、圈闭等石油地质学的基本概念及基础理论为主;下册课文内容则侧重于石油地质学的实际应用及与其密切相关的油气勘探与开发。全书共 30 课,每册 15 课。除篇幅适当的课文外,每课还包括详尽的生词和专业词组注解、习语和短语注解、课文注释和不同类型的练习题及与课文内容相配套的阅读材料等。此外,每册均附有“课文参考译文”、“练习题答案”、“词汇总表”、“习语和短语总表”,以充分利于教学与自学。

该书题材广泛、内容丰富、重点突出、结构紧凑,具有系统性、可读性和实用性,既可作为石油地质专业人员的英语培训教材或英语学习用书,亦可作为高等院校相关专业的英语教学参考书。

编 著

者

说 明

步入新世纪、加入 WTO 后,中国面临新的机遇与挑战。为适应我国石油领域对外交流与合作的迫切需要,提高石油科技工作者和有关涉外人员的专业英语水平与实用能力,胜利油田组织编著了石油英语系列教材。该系列教材包括石油地质、地球物理勘探、钻井、测井、采油、安全环保等专业。各专业英语教材的编著自成体系,独立成书。《石油地质实用英语》(PRACTICAL ENGLISH OF PETROLEUM GEOLOGY)是该英语系列教材之一。

《石油地质实用英语》分上、下两册,按石油地质专业知识结构并兼顾英文难易程度进行编排。上册课文内容以油气生成、运移、聚集、圈闭等石油地质学的基本概念及基础理论为主;下册课文内容则侧重于石油地质学的实际应用及与其密切相关的油气勘探与开发。参考、引用文献主要源自正式出版的英美原著,经精心编著,力求使课文既内容完整,又层次清晰、重点突出,并使全书从总体上体现连续性、系统性、可读性和实用性。

上、下两册共 30 课,每册 15 课。每课包括:课文(TEXT)、生词和专业词组(NEW WORDS AND SPECIALIZED PHRASES)、习语和短语(IDIOMS AND EXPRESSIONS)、课文注释(NOTES TO THE TEXT)、练习题(EXERCISES)及阅读材料(READING MATERIAL)等。全书课文、阅读材料各选编 30 篇,生词和专业词组注解 3 170 多条,习语和短语注解 390 多条。为充分利于教学与自学,每册均附有“课文参考译文”、“练习题答案”、“词汇总表”、“习语和短语总表”。

此外,为方便读者,上册附有英汉对照的“地质年代与地层时序表”、“地质时代符号表”、“API 重度与相对密度对照表”;下册附有英汉对照的“地质图常用符号表”、“常用单位换算表”、“石油地质及相关专业常用英文期刊一览表”。

在中国石化胜利石油管理局教育培训处部署下,在中国石化胜利油田地质科学研究院组织下,全书由胜利油田地质科学研究院与石油大学外国语学院合作编著。解曙巍任主编,张桂萍、王宏、王青、张建国任副主编。参加编著工作的还有赵剑敏、王宏宇。在编著过程中承蒙有关专家及同仁的热诚协助,张宏逵参与了上册“课文参考译文”部分的核校工作,胡济世参与了上、下册“课文参考译文”部分的核校工作,吴锦莲参与了上册课文部分词汇的初步筛选与注解工作,在此一并表示诚挚的谢意。

编著这样一套系统而正规的石油地质类英语教材,是一件很有意义的事情,但也是一项颇为复杂的工程。为此,我们付出了辛勤的努力,但由于我们水平有限,书中难免存有差错或不当之处,敬请读者批评指正。

编著者

2003年5月

CONTENTS

1 LESSON ONE

TEXT: GEOLOGY AND THE SEARCH FOR PETROLEUM	(1)
NEW WORDS AND SPECIALIZED PHRASES	(2)
IDIOMS AND EXPRESSIONS	(4)
NOTES TO THE TEXT	(4)
EXERCISES	(6)
READING MATERIAL: THE ROLE OF GEOLOGY (地质学的作用)	(10)

2 LESSON TWO

TEXT: GENERAL PETROLEUM GEOLOGY	(12)
NEW WORDS AND SPECIALIZED PHRASES	(14)
IDIOMS AND EXPRESSIONS	(15)
NOTES TO THE TEXT	(15)
EXERCISES	(17)
READING MATERIAL: OIL (石油)	(21)

3 LESSON THREE

TEXT: PETROLEUM BASIN CLASSIFICATION	(23)
NEW WORDS AND SPECIALIZED PHRASES	(25)
IDIOMS AND EXPRESSIONS	(26)
NOTES TO THE TEXT	(26)
EXERCISES	(28)
READING MATERIAL: FUNDAMENTAL TYPES OF PETROLIFEROUS BASIN (含油气盆地的基本类型)	(32)



4 LESSON FOUR

TEXT: THE ESSENTIAL CONDITIONS OF FORMATION OF OIL

RESERVOIR	(37)
NEW WORDS AND SPECIALIZED PHRASES	(38)
IDIOMS AND EXPRESSIONS	(39)
NOTES TO THE TEXT	(39)
EXERCISES	(40)

READING MATERIAL: FACTORS CONTROLLING NORTH SEA

HYDROCARBON ACCUMULATIONS (控制北海油气聚集的因素)

.....	(44)
-------	------

5 LESSON FIVE

TEXT: SEDIMENTARY ORGANIC MATTER

(48)

NEW WORDS AND SPECIALIZED PHRASES	(50)
---	------

IDIOMS AND EXPRESSIONS	(52)
------------------------------	------

NOTES TO THE TEXT	(52)
-------------------------	------

EXERCISES	(54)
-----------------	------

READING MATERIAL: ORGANIC MATTER IN SEDIMENTS (沉积

中的有机质)	(57)
--------------	------

6 LESSON SIX

TEXT: HYDROCARBON GENERATION

(60)

NEW WORDS AND SPECIALIZED PHRASES	(63)
---	------

IDIOMS AND EXPRESSIONS	(64)
------------------------------	------

NOTES TO THE TEXT	(65)
-------------------------	------

EXERCISES	(66)
-----------------	------

READING MATERIAL: OIL GENESIS AND TRANSFORMATION

(石油成因与转化)	(70)
-----------------	------

7 LESSON SEVEN

TEXT: SANDSTONE RESERVOIRS AND CARBONATE RESER-

VOIRS	(74)
-------------	------



NEW WORDS AND SPECIALIZED PHRASES	(78)
IDIOMS AND EXPRESSIONS	(80)
NOTES TO THE TEXT	(81)
EXERCISES	(82)
READING MATERIAL: THE RESERVOIR ROCKS (储集层)	(86)

8 LESSON EIGHT

TEXT: PROPERTIES OF SEALS	(90)
NEW WORDS AND SPECIALIZED PHRASES	(93)
IDIOMS AND EXPRESSIONS	(95)
NOTES TO THE TEXT	(95)
EXERCISES	(97)
READING MATERIAL: SEAL PROPERTIES (盖层性能)	(101)

9 LESSON NINE

TEXT: CAP-ROCK AND RETENTION ASSESSMENT	(105)
NEW WORDS AND SPECIALIZED PHRASES	(108)
IDIOMS AND EXPRESSIONS	(109)
NOTES TO THE TEXT	(110)
EXERCISES	(111)
READING MATERIAL: ASSESSMENT OF SEAL RISK (盖层风险评 价)	(115)

10 LESSON TEN

TEXT: HYDROCARBON MIGRATION	(120)
NEW WORDS AND SPECIALIZED PHRASES	(123)
IDIOMS AND EXPRESSIONS	(125)
NOTES TO THE TEXT	(126)
EXERCISES	(127)
READING MATERIAL: VERTICAL HYDROCARBON MIGRATION (烃类垂向运移)	(131)



11 LESSON ELEVEN

TEXT: OIL AND GAS ACCUMULATIONS	(135)
NEW WORDS AND SPECIALIZED PHRASES	(138)
IDIOMS AND EXPRESSIONS	(140)
NOTES TO THE TEXT	(141)
EXERCISES	(142)
READING MATERIAL: THE SIZES AND THE PRODUCTIVE LIFE OF ACCUMULATIONS (石油聚集的规模和开采期限)	(146)

12 LESSON TWELVE

TEXT: TRAPS OF PETROLEUM	(150)
NEW WORDS AND SPECIALIZED PHRASES	(153)
IDIOMS AND EXPRESSIONS	(155)
NOTES TO THE TEXT	(155)
EXERCISES	(156)
READING MATERIAL: TRAPS OF OIL AND GAS (油气圈闭)	(160)

13 LESSON THIRTEEN

TEXT: OIL AND GAS RESERVES CLASSIFICATION	(163)
NEW WORDS AND SPECIALIZED PHRASES	(166)
IDIOMS AND EXPRESSIONS	(169)
NOTES TO THE TEXT	(169)
EXERCISES	(171)
READING MATERIAL: THE PRINCIPLES OF CLASSIFICATION AND OIL RESOURCES ESTIMATION (石油资源分类及评估原 则)	(175)

14 LESSON FOURTEEN

TEXT: THE PETROLEUM SYSTEM	(180)
NEW WORDS AND SPECIALIZED PHRASES	(182)
IDIOMS AND EXPRESSIONS	(184)



NOTES TO THE TEXT	(184)
EXERCISES	(185)
READING MATERIAL: PETROLEUM SYSTEMS: MODELS AND APPLICATIONS (油气系统的模式与应用)	(190)

15 LESSON FIFTEEN

TEXT: SEQUENCE STRATIGRAPHY	(195)
NEW WORDS AND SPECIALIZED PHRASES	(198)
IDIOMS AND EXPRESSIONS	(199)
NOTES TO THE TEXT	(200)
EXERCISES	(201)
READING MATERIAL: APPLICATION OF SEQUENCE STRATIGRAPHY TO LACUSTRINE STRATA (层序地层学在湖相地层中的应用)	(205)

附录一 课文参考译文	(208)
附录二 练习题答案	(236)
附录三 词汇与习语和短语总表	(253)
附表一 地质年代与地层时序表	(287)
附表二 地质时代符号表	(292)
附表三 API 重度与相对密度对照表	(293)
参考文献	(294)

LESSON ONE



TEXT

GEOLOGY AND THE SEARCH FOR PETROLEUM

ONE

LESSON

Geology is a natural science. With it men can discover all kinds of useful minerals. Geology studies the earth. But of the three spheres, the atmosphere, the hydrosphere and the lithosphere, it only directly studies the lithosphere.^① It studies the composition and distribution of material in the earth's crust. It studies also the formation, changes and development of rocks and minerals in the earth's crust.

Geology is a very complex science. There are many branches in geology. Mineralogy is the science of the minerals. Petrology is the science of the rocks. Geomorphology deals with the origin of landscapes and changes in them.^② Historical geology traces the evolution and development of the earth and of the animals and plants on it.^③ Stratigraphy studies the sequence of the rocks in the earth's crust. Paleontology deals with the ancient animals and plants. These are just a few of the most important branches of geology.

Geology is a very important science. We depend upon geology for the discovery of mineral deposits needed by the various industries.^④ A lot of minerals are used as fuel and raw materials.^⑤ Without them industrialization is impossible. Minerals are also used as fertilizers in agriculture. China is very rich in mineral deposits of all kinds. The study of geology will help us to discover them.

Petroleum (rock-oil, from the Latin *petra*, rock or stone, and *oleum*, oil) occurs widely in the earth as gas, liquid, semisolid, or solid, or in more than one of these states at a single place. Chemically any petroleum is an extremely complex mixture of hydrocarbon (hydrogen and carbon) compounds, with minor amounts of nitrogen, oxygen, and sulfur as impurities. Liquid petroleum, which is called *crude oil* to distinguish it from refined oil, is the most important commercially. It consists chiefly of the liquid hydrocarbons, with varying amounts of dissolved gases, bitumens, and impurities.

Petroleum gas, commonly called *natural gas* to distinguish it from manufactured gas, consists of the lighter paraffin hydrocarbons, of which the most abundant is methane gas (CH_4).^⑥ The semisolid and solid forms of petroleum consist of the heavy hydrocarbons and bitumens.

Geology plays an important role in the search for oil and natural gas. Four prerequisites are necessary for oil (and gas) to accumulate in commercial quantities in an area: (1) The oil originates in a source bed, and a marine shale, once a black mud rich in organic compounds, is thought to be a common source rock.^⑦ (2) The oil then migrates to a permeable reservoir rock, and to do this it may travel for long distances both vertically and horizontally.^⑧ Oil cannot move through the tiny openings of the shale source beds rapidly enough to be extracted profitably. (3) A nonpermeable layer must occur above a reservoir bed. Since oil is lighter than water, it tends to move upward through openings and cracks until it encounters impervious beds that it cannot penetrate. The oil may then accumulate beneath the impervious layers. Some gas occurs in solution within the oil, and if enough is present it separates out to occupy the uppermost region of such a trap.^⑨ (4) A favorable structure must exist to concentrate the oil and anticlines, salt plugs, and faults are common examples. A fault zone may itself be impervious, or faulting may have shifted an impervious bed so that it now blocks a reservoir bed. Stratigraphic traps tend to be more difficult to locate and may form where tilted reservoir beds are overlain unconformably by impervious layers or where the reservoir beds become thinner up-dip and wedge out within enclosing impervious beds. Thus oil that was once distributed in sparse amounts throughout a very large volume of rock may now be richly concentrated within the uppermost portions of favorable reservoir rocks.

The task of the geologist is the location of promising structures in regions where rocks are favorable for the occurrence of the other prerequisites.^⑩ Drilling a hole is then the only known method of determining whether or not oil is present in the structure.^⑪

NEW WORDS AND SPECIALIZED PHRASES

geology [dʒi'ɒlədʒi] *n.* 地质;地质学
petroleum [pi'trəʊljəm] *n.* 石油,原油
natural science 自然科学
mineral ['minərəl] * *n.* 矿物,矿石 *a.* 矿物的;无机的
sphere [sfɪə] *n.* 圈;区域
atmosphere [ætməsfiə] *n.* 大气,大气圈,大气层
hydrosphere ['haɪdrəsfiə] *n.* 水界,水圈
lithosphere ['liθəsfiə] *n.* 岩石圈
composition [kəmˈpəʒɪʃən] *n.* 组成,组织,结构,成分
distribution [ˌdɪstrɪ'bjuːʃən] *n.* 分布,分配
crust [krʌst] *n.* 地壳
formation [fɔː'meɪʃən] *n.* 生成;岩层,组
branch [brɑːntʃ] *n.* [学科]分科,分支,部门

mineralogy [ˌmɪnə'rælədʒi] *n.* 矿物学
petrology [pi'trɒlədʒi] *n.* 岩石学
geomorphology [ˌdʒiːəmə'fɒlədʒi] *n.* 地貌学,地形学
origin ['ɒrɪdʒɪn] *n.* 起源,起因,成因
landscape ['lændskeɪp] *n.* 地形
historical [hɪs'tɒrɪkəl] *a.* 历史的,历史上的;有关历史的
historical geology 地史学
evolution [ˌiːvə'ljuːʃən, ˌevə'ljuːʃən] *n.* 发展,进化,演化,演变
stratigraphy [strə'tɪgrəfi] *n.* 地层学;区域地层
sequence ['siːkwəns] *n.* 层序,次序,顺序
paleontology [ˌpæliən'tɒlədʒi] *n.* 古生物学
deposit [dɪ'pɒzɪt] *n.* 矿床;沉淀;沉积物 *v.*

* 所注音标中可不发音的音素用斜体表示。



(使)沉积

mineral deposit 矿床; 矿藏

industrialization [in,dʌstriəlai'zeɪʃən] *n.* 工业化, 产业化

fertilizer ['fɜ:tilaɪzə] *n.* 肥料 (尤指化学肥料)

rock [rɒk] *n.* 岩石, 石头

rock-oil (= rock oil) *n.* 石油

semisolid [ˌsemi'sɒlɪd, ˌsemaɪ'sɒlɪd] *a.* 半固体的 *n.* 半固体

mixture ['mɪkstʃə] *n.* 混合, 混合物

hydrocarbon ['haɪdrəu'kɑ:bən] *n.* 烃, 碳氢化合物; 油气

hydrogen ['haɪdrədʒən, 'haɪdrɪdʒən] *n.* 氢

carbon ['kɑ:bən] *n.* 碳

compound ['kɒmpaʊnd] *n.* 化合物, 混合物, 复合物

nitrogen ['naɪtrədʒən, 'naɪtrɪdʒən] *n.* 氮, 氮气

oxygen ['ɒksɪdʒən] *n.* 氧, 氧气

sulfur ['sʌlfə] *n.* 硫, 硫磺

impurity [ɪm'pjʊərɪti] *n.* 杂质, 混杂物

crude [kru:d] *a.* 粗的, 未加工的, 天然的, 原生的

crude oil 原油

petroleum gas 石油气

natural gas 天然气

distinguish [dɪ'stɪŋɡwɪʃ] *vt.* 区别, 辨别

bitumen ['bɪtjumin] *n.* 沥青

paraffin ['pærəfɪn, 'pærəfɪ:n] *n.* 石蜡, 石蜡族烃, 链烷烃

methane ['mi:θeɪn] *n.* 甲烷, 沼气

prerequisite ['pri:'rekwɪzɪt] *n.* 先决条件

accumulate [ə'kju:mjuleɪt] *v.* 聚集, 堆积

bed [bed] *n.* 层, 矿床

source bed 烃源层, 生油层, 生气层; 源(岩)层

marine [mə'ri:n] *a.* 海上的, 海洋的; 海相的

shale [ʃeɪl] *n.* 页岩, 泥岩, 泥板岩

marine shale 海相页岩

black mud 黑泥, 碳质页岩

organic [ɔ:'gænik] *a.* 有机的, 生物的, 结构的
organic compound 有机化合物

source rock 源岩, 烃源岩, 生油岩, 油源岩, 气源岩

migrate [maɪ'greɪt, 'maɪgreɪt] *vi.* 运移, 迁移, 移动

permeable ['pə:miəbl] *a.* 透水的, 可渗透的, 具渗透性的

reservoir ['rezəvwa:] *n.* 储集层, 储层, 油层, 产油层, 油藏

reservoir rock 储集岩

extract [ɪks'trækt] *vt.* 提取, 抽取

profitably ['prɒfɪtəbli] *ad.* 有利地, 有益地

nonpermeable ['nɒn'pə:miəbl] *a.* 不渗透的, 不透水的

reservoir bed 储集层, 储层, 蓄油层, 蓄气层

impervious [ɪm'pɜ:vjəs] *a.* 不渗透的, 密封的

impervious bed 非渗透层

solution [sə'lu:ʃən, sə'ljʊ:ʃən] *n.* 溶解; 溶液

occupy ['ɒkjupaɪ] *vt.* 占, 占据

uppermost ['ʌpəməʊst] *a.* 最高的, 最上部的; 最主要的

trap [træp] *n.* 圈闭, 储油构造

concentrate ['kɒnsentreɪt] *v.* 集中; 富集; 浓缩 *a.* 浓缩的

anticline ['æntɪklaɪn] *n.* 背斜

salt [sɔ:lt] *n.* 盐 *a.* 含盐的

salt plug 盐柱, 盐栓

fault [fɔ:lt] *n.* 断层, 断裂, 层错

fault zone 断层带, 断裂带

block [blɒk] *vt.* 阻塞, 堵塞

stratigraphic [ˌstræti'græfɪk] *a.* 地层的, 地层学的

stratigraphic trap 地层圈闭

overlie [ˌəʊvə'laɪ] (overlay [ˌəʊvə'lei]; overlain [ˌəʊvə'leɪn]; overlying [ˌəʊvə'laɪɪŋ]) *vt.* 伏在...上面, 压在...上面, 覆盖在...上面

unconformably [ˌʌn-kən'fɔ:məbli] *ad.* 不整合地



up-dip ['ʌpdɪp] *ad.* 向上倾斜地

wedge [wedʒ] *vi.* 楔入 *n.* 楔, 楔形体, 楔形层

enclose [ɪn'kləʊz] *vt.* 包围, 围住; 圈住

sparse [spɑ:s] *a.* 稀少的, 稀疏的

richly ['rɪtʃli] *ad.* 丰富地, 富饶地

promising ['prɒmɪʃɪŋ] *a.* 有希望的, 有远景的

IDIOMS AND EXPRESSIONS

all kinds of 各种各样的

to deal with 处理, 研究; 对待; 涉及; 与...交涉

to depend upon 依靠, 取决于

to be rich in 富于...的, ...丰富的, 含...很丰富的

of all kinds 各种各样的

to distinguish A from B 把 A 和 B 区别开

to consist of 包括, 由...组成, 由...构成

to play an important role in... 在...方面起重要作用

both...and... 不但...而且...; ...和...两者都

NOTES TO THE TEXT

1. But of the three spheres, the atmosphere, the hydrosphere and the lithosphere, it only directly studies the lithosphere.

该句中的介词 *of* 表示部分与整体的关系, 作“在...中”解。the atmosphere... the lithosphere 是 the three spheres 的同位语。主语 *it* 代 *geology*。

全句的意思是: 然而, 在大气圈、水圈和岩石圈这三个圈中, 地质学只直接研究岩石圈。

2. Geomorphology deals with the origin of landscapes and changes in them.

句中, *in them* 是作定语用的介词短语, 修饰 *changes*; 其中, *them* 代 *landscapes*。

本句的意思是: 地貌学研究地形的成因及其变化。

3. Historical geology traces the evolution and development of the earth and of the animals and plants on it.

句中的 *the evolution and development* 是 *traces* 的宾语, 它有两个介词短语作其定语, 即 *of the earth* 和 *of the animals and plants on it*; *it* 代 *the earth*。

本句可译为: 地史学探讨地球及其动植物的演化和发展。

4. We depend upon geology for the discovery of mineral deposits needed by the various industries.

句中的介词短语 *for... industries* 作目的状语, 其中的 *needed... industries* 是过去分词短语作定语, 修饰 *mineral deposits*。

本句的意思是: 我们依靠地质学去发现各种工业所需的矿藏。

5. A lot of minerals are used as fuel and raw materials.

句中, *as fuel and raw materials* 这一短语在意义上说明句子前面的主语 *minerals*, 亦可解释为主语补足语。as 作“作为”、“当做”解。

本句可译为: 许多矿物可用做燃料和原材料。

6. Petroleum gas, commonly called *natural gas* to distinguish it from manufactured gas, con-