

全国高职高专规划教材

环境工程专业英语

ENGLISH FOR ENVIRONMENTAL ENGINEERING

张之浩 王 晖 主编

中国环境出版社

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图书在版编目 (CIP) 数据

环境工程专业英语 / 张之浩, 王晖主编. —北京: 中国环境出版社, 2014.8

全国高职高专规划教材

ISBN 978-7-5111-2021-2

I. ①环… II. ①张… ②王… III. ①环境工程—英语—高等职业教育—教材 IV. ①H31

中国版本图书馆 CIP 数据核字 (2014) 第 162786 号

出版人 王新程
责任编辑 黄晓燕 侯华华
责任校对 尹芳
封面设计 宋瑞

出版发行 中国环境出版社
(100062 北京市东城区广渠门内大街 16 号)
网 址: <http://www.cesp.com.cn>
电子邮箱: bjgl@cesp.com.cn
联系电话: 010-67112765 (编辑管理部)
010-67112735 (环评与监察图书出版中心)
发行热线: 010-67125803, 010-67113405 (传真)

印 刷 北京市联华印刷厂
经 销 各地新华书店
版 次 2014 年 8 月第 1 版
印 次 2014 年 8 月第 1 次印刷
开 本 787 × 960 1/16
印 张 13.5
字 数 340 千字
定 价 26.00 元

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前 言

教育部高等教育司 2006 年颁布的《高职高专教育英语课程教学基本要求（试行）》中指出：“在完成《基本要求》的教学任务后，应结合专业学习，开设专业英语课程，这既可保证学生在校期间英语学习的连续性，又可使他们所学的英语得到实际的应用。”这说明为培养面向 21 世纪的高等技术应用性人才，开设专业英语是十分必要的。

由于环境工程专业具有多学科性和全球性的特点，对于本专业的高等技术应用性人才，在以英语为工具，获取专业所需信息，处理与实际工作有关的英语科技资料以及进行基础的涉外专业交流等方面，应具有更强的能力。为了达到这一目标，长沙环境保护职业技术学院专职英语教师和环境工程专业教师合作编写了《环境工程专业英语》教材，供相关专业的高职高专学生试用，并在教学实践中修订与完善。

本书具有如下特点：

(1) 专业内容选用最新科技材料，重点突出，要点兼顾。全书共分四个部分，含 10 个单元，每单元编有课文一篇或两篇，配练习题若干，部分单元附有阅读文章对课文内容进行补充。内容涉及环境科学、生态学、环境工程 and 环境污染等方面，重点突出水、气、渣的污染治理和资源回收利用及分析检测技术等环境工程专业知识。

(2) 本书体裁多样，语言规范，实用性强。选材时考虑到了未来的环境工程技术人员在实际工作中常涉及的英语资料的主要方面，材料的实用性成为编者选材的重要标准，尽可能选取了相关专业最基础

和最广泛应用的专业语汇和专业材料来编写词汇表、注释和习题，并将水处理平台的操作流程编为教学重点。体裁涵盖了技术论文、科技报告、检测方法和实验器材说明等。

(3) 本书主要读者对象为大专院校和职业技术学院环境工程相关专业学生及相关专业技术人员。编写时除了考虑到内容的连续性、相关性和全书的梯度外，还对原文中较专业的内容及较难的词和句进行了注释。各单元后附精心编排的习题、习题答案和课文参考译文也是本书的一大特点，既便于老师组织课堂教学和操练，又为学生和自学者提供了充足的自修材料。练习题的题型多样，主要有简答问题、多项选择和正误判断——旨在提高学生的阅读理解能力；图表填空、词和短语的翻译和匹配——促使学生熟记本专业常用的词汇和表达法；现场模拟阐述——旨在锻炼学生的专业英语口语表达能力；英译汉——提高学生对于长、难句的理解能力；汉译英——培养学生专业英语方面的初步写作能力；段落翻译——内容与本单元有关，但难度稍低，可用来测试学生的阅读理解能力。

本教材编写组由长沙环境保护职业技术学院环境工程系三位专业教师和基础部五位专职英语教师组成，张之浩、王晖任主编，第一部分第一单元、第五单元和第二部分第一单元、第二单元由张之浩、王晖编写，第一部分第二单元由李欢、蔡媛编写，第一部分第三单元由李欢、杨帆编写，第一部分第四单元由王真真、周建华编写，第二部分第一单元、第二单元由王真真、易彩纯编写，第三部分第一单元、第二单元由王真真、王晖编写，第四部分由刘峥编写。教材课文选材由张之浩、李欢和王真真负责完成，课文后的生词音标、表达法解释、课文注释、课后习题、习题答案和课文翻译由王晖、周建华、易彩纯、杨帆、蔡媛负责完成，其中张之浩提供的水处理平台课文系原创。教材后附的专业词汇表由李欢提供。本教材体现了高职英语教学为学生专业服务的宗旨，将由专职英语教师和环境工程专业教师在合作授课

的教学实践中根据学生实际水平和行业要求不断修订和完善。

本教材在编写过程中得到了长沙环境保护职业技术学院李倦生书记、吕文明院长、黄忠良副院长、孙蕾副院长、环境工程系吴同华主任和教务处刘杨林主任等领导的大力支持，并提出了许多宝贵意见，谨在此表示衷心感谢。

本教材涉及环境工程专业内容较多，学科面广，以及限于编者水平，错误之处在所难免，希望读者不吝指正，不胜感谢。

【本书系湖南省教育科学“十二五”规划2012年度大学英语教学研究专项课题“高职理工科学生翻译技能培养有关问题研究”（课题批准号：XJK12YYB003）与2012年度湖南省教育厅科学研究项目一般项目“对科技翻译研究困境的反思及对策研究”（项目批准号：12C0927）的部分研究成果。】

编者

2014年5月

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Part I Water Treatment

Unit 1 Brief Introduction to Water Treatment

Text Water Pollutants and Their Sources

The wide range of pollutants that are being discharged to surface waters can be grouped into broad classes.

Point Sources

Domestic sewage and industrial wastes are called point sources because they are generally collected by a network of discharge into the receiving water of pipes or channels and conveyed to a single point of discharge into the receiving water. Domestic sewage consists of wastes from homes, schools, office buildings, and stores. The term (术语) municipal sewage is used to mean domestic sewage into which industrial wastes are also discharged. In general, point source pollution can be reduced or eliminated through proper wastewater treatment prior to discharge to a natural water body.

Non-point Sources

Urban and agricultural runoff are characterized by multiple discharge points. These are called non-point sources. Often flow of polluted water flows over the surface of the land or along natural drainage channels to the nearest water body. Even when urban or agricultural runoff waters are collected in pipes or channels, they are generally transported the shortest possible distance for discharge, so that wastewater treatment at each outlet is

not economically feasible. Much of the non-point source pollution occurs during rain storms or spring snowmelt resulting in large flow rates that make treatment even more difficult. Reduction of non-point source pollution generally requires changes in land use practices and improved education.

Oxygen-demanding Material

Anything that can be oxidized in the receiving water with the consumption of dissolved molecular oxygen is termed oxygen-demanding material. This material is usually biodegradable organic matter but also includes certain inorganic compounds. The consumption of dissolved oxygen, DO, poses a threat to higher forms of aquatic life that must have oxygen to live. The critical level of DO varies greatly among species. For example, brook trout (溪点红蛙) may require about 7.5 mg/L of DO, while carp (鲤鱼) may survive at 3 mg/L. As a rule, the most desirable commercial and game fish require high levels of dissolved oxygen. Oxygen-demanding materials in domestic sewage come primarily from human waste and food residue. Particularly noteworthy among the many industries which produce oxygen-demanding wastes are the food processors and the paper industry. Almost any naturally occurring organic matter, such as animal droppings, crop residues, or leaves, which get into the water from non-point sources, contribute to the depletion of DO.

Nutrients

Nitrogen and phosphorus, two nutrients of primary concern, are considered pollutants because they are too much of a good thing. All living things require these nutrients for growth. Thus, they must be present in rivers and lakes to support the natural food chain. Problems arise when nutrient levels become excessive and the food web is grossly disturbed, which causes some organisms to proliferate at the expense of others. As will be discussed in a later section, excessive nutrients often lead to large growths of algae, which in turn become oxygen-demanding material when they die and settle to the bottom. Some major sources of nutrients are phosphorus-based detergents, fertilizers, and food-processing wastes.

Pathogenic Organisms

Microorganisms found in wastewater include bacteria, viruses, and protozoa excreted by diseased persons or animals. When discharged into surface waters, they make the water

unfit for drinking. If the concentration of pathogens is sufficiently high, the water may also be unsafe for swimming and fishing. Certain shellfish (甲壳类动物, 贝类) can be toxic because they concentrate pathogenic organisms in their tissues, making the toxicity levels in the shellfish much greater than the levels in the surrounding water.

Suspended Solids

Organic or inorganic particles that are carried by the wastewater into a receiving water are termed suspended solids (SS). When the speed of the water is reduced by flowing into a pool or a lake, many of these particles settle to the bottom as sediment. In common usage, the word sediment also includes eroded soil particles which are being carried by water even if they have not yet settled. Colloidal particles which do not settle readily cause the turbidity found in many surface waters. Organic suspended solids may also exert an oxygen demand. Inorganic suspended solids are discharged by some industries but result mostly from soil erosion that is particularly bad in areas of logging, strip mining (露天开采), and construction activity. As excessive sediment loads are deposited into lakes and reservoirs, their usefulness is reduced. Even in rapidly moving mountain streams, sediment from mining (采矿业) and logging operations (采伐作业) has destroyed many living places (ecological habitats) for aquatic organisms. For example, salmon (鲑鱼) eggs can only develop and hatch in loose gravel (松散的砾石) stream beds. As the pores (气孔) between the pebbles (鹅卵石) are filled with sediment, the eggs suffocate (窒息) and the salmon population is reduced.

Toxic Metals and Toxic Organic Compounds

Agricultural runoff often contains pesticides and herbicides that have been used on crops. Urban runoff is a major source of lead and zinc in many water bodies. The lead comes from the exhaust of automobiles using leaded gasoline, while the zinc comes from tire wear (轮胎磨损). Many industrial wastewaters contain either toxic metals or toxic organic substances. If discharged in large quantities, many of these materials can make a body of water nearly useless for long periods of time. The lower James River in Virginia has been reduced to use only as a shipping channel because of a large industrial discharge of highly toxic and persistent organic compounds. Many toxic compounds are concentrated in the food chain, making fish and shellfish unsafe for human consumption. Thus, even small quantities in the water can be incompatible (不相容的) with the natural ecosystem and many human uses.

Heat

Although heat is not often recognized as a pollutant, those in the electric power industry are well aware of the problems of disposing of waste heat. Also, many industrial process waters are much hotter than the receiving waters. In some environments an increase of water temperature can be beneficial. For example, production of clams (蛤蚌) and oysters (牡蛎) can be increased in some areas by warming the water. On the other hand, increases in water temperature can have negative impacts. Many important commercial and game fish such as salmon and trout (鳟鱼) will only live in cool water. In some instances the discharge of heated water from a power plant can completely block salmon migration (洄游) . Higher temperatures also increase the rate of oxygen depletion in areas where oxygen-demanding wastes are present.

Words and Expressions

- pollutant [pə'l(j)u:t(ə)nt] *n.* 污染物
discharge [dis'tʃɑ:dʒ] *vt. vi. n.* 排放
sewage ['su:ɪdʒ] *n.* 污水
urban ['ɜ:b(ə)n] *adj.* 城市的
domestic [də'mestɪk] *adj.* 国内的; 家庭的
pipe [paɪp] *n.* 管子
eliminate [ɪ'limineɪt] *vt.* 消除; 排除
treatment ['tritmənt] *n.* 处理; 治疗; 对待
oxidize ['ɒksɪdaɪz] *vt. vi.* 使氧化; 氧化
reduction [ri'dʌkʃ(ə)n] *n.* 减少; 下降
consumption [kən'sʌm(p)ʃ(ə)n] *n.* 消耗; 消费
dissolve [dɪ'zɒlv] *vt. vi.* 使溶解(分解); 溶解(分解)
molecular [mə'lekjələ] *adj.* 分子的; 由分子组成的
biodegradable [ˌbaɪə(ʊ)di'greɪdəb(ə)l] *adj.* 可生物降解的
organic [ɔ:'gænik] *adj.* 有机的; 器官的; 组织的
organism [ˈɔ:g(ə)nɪz(ə)m] *n.* 有机体; 生物体; 微生物
microorganism [maɪkrəʊ'ɔ:g(ə)nɪz(ə)m] *n.* 微生物; 微小动植物
compound ['kɒmpaʊnd] *vt.* 合成; 混合
n. 化合物; 混合物
adj. 混合的; 复合的

- depletion [di'pli:ʃn] *n.* 消耗; 损耗; 耗尽
- residue [rezidju:] *n.* 残渣; 滤渣
- nutrient ['nju:triənt] *n.* 营养物质; 营养盐; 滋养物
- nitrogen ['naitrədʒ(ə)n] *n.* 氮
- phosphorus ['fɒsf(ə)rəs] *n.* 磷
- excessive [ik'sesiv; ek-] *adj.* 过多的, 极度的; 过分的
- proliferate [prə'lifəreit] *vt. vi.* 使激增; 激增; 增殖; 扩散
- algae ['ældʒi:] *n.* 藻类; 海藻
- detergent [di'tɜ:dʒ(ə)nt] *n.* 清洁剂; 洗涤剂; 洗衣粉
- fertilizer ['fɜ:tilaizə] *n.* 肥料
- pathogenic [ˌpæθə'dʒenik] *adj.* 致病的; 病原的; 发病的 (等于 pathogenetic)
- bacteria [bæk'tiəriə] *n.* 细菌
- viruses ['vaiərəsɪz] *n.* 病毒; 病毒 (virus 的复数)
- protozoa [ˌprəʊtə(ʊ)'zəʊə] *n.* [无脊椎] 原生动物; 原生动物类 (protozoan 的复数)
- excrete [ik'skri:t; ek-] *vt.* 排泄; 分泌
- concentration [kɒns(ə)n'treɪʃ(ə)n] *n.* 浓度; 集中; 浓缩; 专心; 集合
- toxic ['tɒksik] *adj.* 有毒的; 中毒的
- toxicity [tɒk'sisəti] *n.* 毒性
- particle ['pɑ:tɪk(ə)l] *n.* 微粒; 颗粒
- sediment ['sedim(ə)nt] *n.* 沉积; 沉淀物
- settle ['set(ə)l] *vt.* 沉淀
- turbidity [tɜ:'bidəti] *n.* 浑浊; 浑浊度
- aquatic [ə'kwætɪk; -'kwɒt-] *adj.* 水生的; 水栖的
- pesticide ['pestisaɪd] *n.* 杀虫剂
- herbicide ['hɜ:bisaɪd] *n.* 除草剂
- lead [li:d] *n.* 铅
- zinc [zɪŋk] *n.* 锌
- exhaust [ɪg'zɔ:st; eg-] *n.* 排气; 废气; 排气装置
vt. 排出; 耗尽
vi. 排气
- substance [ˌsʌbst(ə)ns] *n.* 物质
- ecosystem ['i:kəʊsɪstəm] *n.* 生态系统
- dispose [di'spəʊz] *vt. vi. n.* 处理; 处置

surface water 地表水

domestic sewage	生活污水
municipal sewage	城市污水
point source pollution	点源污染
non-point source pollution	面源污染
agricultural runoff	农田径流, 农田污水排放
natural drainage channel	自然排水沟
wastewater treatment	废水处理
prior to	在……之前; 居先
oxygen-demanding material	耗氧物质; 需氧物质
pose a threat to	对……造成威胁
critical level	临界水平; 临界高度
suspended solid	悬浮物; 悬浮体
colloidal particle	胶粒, 胶体微粒
negative impact	负面影响
waste heat	废热

Notes

1. Domestic sewage and industrial wastes are called point sources because they are generally collected by a network of discharge into the receiving water of pipes or channels and conveyed to a single point of discharge into the receiving water. 生活污水和工业废水都称为水污染点源, 这是因为它们通常都会被一个由各种管道或渠道形成的网络收集起来, 并集中到某个排放点排入收纳水体。

- industrial waste 工业废弃物, 课文此处指工业废水
- point source 点源
- non-point source 非点源
- receiving water 收纳水体
- convey 运输; 传递; 转达
- be conveyed to 被传送到

eg. I can't convey my feelings in words. 我无法用言语表达我的心情。

In communications, the problem of electronics is how to convey information from one place to another. 在通讯系统中, 电子设备要解决的问题是如何把信息从一个地方传递到另一个地方。

2. Often flow of polluted water flows over the surface of the land or along natural drainage channels to the nearest water body. 通常这类污水会在地表横流或者沿着天然的排水沟流入距离最近的水体。

- flow *n.* 流动; 流量; 泛滥; 涨潮
 vt. 淹没; 溢过
 vi. 流动; 涌流
 - flow over 溢出; 横流
 - drainage channel 排水沟; 下水道
 - water body 水体, 水域, 储水池
3. Anything that can be oxidized in the receiving water with the consumption of dissolved molecular oxygen is termed oxygen-demanding material. 所有在容纳水体中能够通过消耗水中的溶解氧而被氧化的物质都可以叫做耗氧物质。
- that 从句作为定语从句修饰本句的主语 anything, 关系代词 that 引导定语从句, 并在定语从句中作主语, 指导先行词 anything, 不可省略; 由于先行词 anything 是不定代词, that 不能替换成 which
 - term 术语; 把……叫做
 - is termed=is called, is named 被命名为……; 被称为……; 被叫做……
 eg. Organic or inorganic particles that are carried by the wastewater into a receiving water are termed suspended solids (SS). 被废水带入某个容纳水体的有机微粒和无机微粒被称为悬浮固体。
4. As a rule, the most desirable commercial and game fish require high levels of dissolved oxygen. 通常最适合的商业鱼类和猎用鱼类的生存都需要高的溶解氧浓度。
- game fish 供垂钓的鱼
 - as a rule 通常; 一般来说
5. Nitrogen and phosphorus, two nutrients of primary concern, are considered pollutants because they are too much of a good thing. 氮和磷这两种最主要的营养物质也被看成污染物质, 因为它们太多了也会变成坏事。
- too much of a good thing 好事过头反成坏事; 一件本来很好的事, 一旦超过反而适得其反
 eg. Sunlight may be the best disinfectant, but there can be too much of a good thing. 阳光或许是最好的消毒剂, 但凡事过犹不及。
6. Inorganic suspended solids are discharged by some industries but result mostly from soil erosion that is particularly bad in areas of logging, strip mining, and construction activity. 无机悬浮颗粒是从某些工厂企业排放出来, 但多半是水土流失造成的, 这在那些伐木、露天采矿和建筑施工活动区域情况尤其严重。
- result from 起因于; 由……造成
 - erode 侵蚀; 腐蚀; 冲刷
 - soil erosion *n.* 土壤侵蚀; 水土流失

7. The lower James River in Virginia has been reduced to use only as a shipping channel because of a large industrial discharge of highly toxic and persistent organic compounds. 由于沿岸工厂产生的剧毒和持久性有机物的大量排放，弗吉尼亚州的詹姆斯河下游现在仅能用作航运通道。

• be reduced to 沦为；简化为；减小为；分解为

8. Higher temperatures also increase the rate of oxygen depletion in areas where oxygen-demanding wastes are present. 较高的水温也提高了存在耗氧废弃物的水域的耗氧率。

• increase *vt. vi. n.* 增加；提高

eg. The population continues to increase. 人口持续增长。

It caused an increase of population in the area. 这导致了该地区的人口增长。

Exercises

I. Best choices.

1. The wide range of pollutants that are being discharged to _____ waters can be grouped into broad classes.

A. rain B. ice C. fresh D. surface

2. Municipal sewage means both domestic sewage and _____ wastes.

A. surface B. urban C. industrial D. agricultural

3. Reduction of non-point source pollution is very _____.

A. quick B. easy C. difficult D. simple

4. DO means _____ in the third paragraph.

A. defensive organization B. dissolved oxygen
C. depleted organism D. domestic oxidization

5. _____ is not pathogenic organism.

A. Bacteria B. Viruses C. Protozoa D. Phosphorus

II. Decide whether each of the following statements is true (T) or false (F) according to the text.

() 1. Urban and agricultural runoff are called non-point sources.

() 2. Paper industry may produce oxygen-demanding wastes.

() 3. The abbreviation of organic or inorganic particles that are carried by the wastewater into a receiving water are termed BOD.

() 4. Small quantities of toxic compounds in the water can be compatible with the natural ecosystem and many human uses.

() 5. Heat is often recognized as a pollutant.