



高职高专“十一五”规划教材

# 室内环境检测专业英语

贺小凤 主编



化学工业出版社

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· 北 京 ·

本书是一本体系完整、知识全面的室内环境检测和控制技术的英语教材。内容涵盖了室内空气质量的基础知识；室内空气质量检测方法；甲醛、氨和生物性污染物等室内空气污染物的危害；健康环保的室内装修；汽车内空气质量等室内环境保护知识。本书内容可读性强，能反映出室内环境保护领域的最新动向和专业英语最新词汇。

本书不仅可以作为高职高专室内检测与控制技术专业的教科书，也可以作为其他环境类专业英语教材，还可供同等英语程度的室内环境技术人员或相近环保领域人员使用。

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# 前 言

为了使高职高专环境类专业的学生掌握专业英语词汇，熟悉科技交流的英语表达方法，能顺利地阅读英文版的室内环境科技读物，更大程度地丰富专业知识，多层次、多角度了解和把握国内外环保科技的进展，我们编写了《室内环境检测专业英语》。

本教材力求给读者提供一本体系完整、知识全面的室内环境检测和控制技术的英语阅读材料，内容涵盖了室内空气质量的基础知识；室内空气质量检测方法；甲醛、氨和生物性污染物等室内空气污染物的危害；健康环保的室内装修；汽车内空气质量等室内环境保护知识。课文内容可读性强，能反映出室内环境保护领域的最新动向和专业英语最新词汇。

本教材的每个单元均由课文和阅读材料组成，并附有练习。Unit 1~9 和 Unit 11~13 由贺小凤编写，Unit 10 和 Unit 15 由周彦兵编写，Unit 14 由熊纓编写。此外，本教材每个单元均设有“技能训练”的项目，分别介绍了科技英语的翻译、口语和写作技巧，并配有相关练习，方便学生进行专项训练。这部分内容，均由扈畅编写。最后，由贺小凤统稿。

本教材为了让读者学到纯正的专业英语，所有课文和阅读材料的编写均参考了原版英文教科书、著作、期刊和国外英文网站。在此谨向原作者、出版社和有关网站致谢。

由于编者水平有限，且编写时间仓促，书中难免存在疏漏及不当之处，敬请广大读者批评指正。

编 者

2007 年 3 月

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# **Part I**

## **Indoor Air Quality**





## **Unit 1 Indoor Air Quality Concerns**

All of us face a variety of risks to our health as we go about our day-to-day lives. Driving in cars, flying in planes, engaging in recreational activities, and being exposed to environmental pollutants all pose varying degrees of risk. Some risks are simply unavoidable. Some we choose to accept because to do otherwise would restrict our ability to lead our lives the way we want. And some are risks we might decide to avoid if we had the opportunity to make informed choices. Indoor air pollution is one risk that you can do something about.

### **1. Indoor Air Quality (IAQ) Problems**

In 1976, industrial hygienists started investigating Indoor Air Quality (IAQ) problems. Since then the concern persists and continues to increase. Indoor air quality has become an important occupational health and safety issue. Energy conservation measures instituted in early 1970's often led to reduced intake of outside air and increased the potential for build-up of internally generated air pollution.

Indoor Air Quality problems occur in buildings where chemical and biological contaminants build up to levels that can adversely affect some occupants. The following are some commonly reported health effects: headache, nausea, fatigue, drowsiness, dizziness, respiratory problems, chest tightness, dry throat, skin rashes, dry and itchy eyes, stuffy nose, runny nose, loss of concentration and general malaise.

Workplace conditions such as noise, inadequate lighting, inadequate thermal environment, and ergonomic problems can cause discomfort that is sometimes falsely attributed to chemical or biological contaminants in the air.

In the past, symptoms reported by building occupants were often considered psychological because the symptoms seemed variable and subjective, and because an exact cause could not be identified. It is rarely possible to prove that these symptoms are related to a particular indoor air contaminant. In fact, building occupants are simultaneously exposed to a wide range of indoor air contaminants.

In the last several years, a growing body of scientific evidence has indicated that the air within homes and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialized cities. Other research indicates that people spend approximately 90 percent of their time indoors. Thus, for many people, the risks to health may be greater due to exposure to air pollution indoors than outdoors.

People want their homes to be free from indoor air pollutants and toxic substances that can affect the health of children and other family members. You spend 80 to 90 percent of

your time indoors, and you may have family members with health conditions which are affected by pollutants. In addition, people who may be exposed to indoor air pollutants for the longest periods of time are often those most susceptible to the effects of indoor air pollution. Such groups include the young, the elderly, and the chronically ill, especially those suffering from respiratory or cardiovascular disease.

## 2. Indoor Air Pollution Standards

The NHMRC ( National Health and Medical Research Council ) defines indoor air as any non-industrial indoor space where a person spends a period of an hour or more in any day. This can include the office, classroom, motor vehicle, shopping centre, hospital and home.

Historically, indoor air quality has been addressed to varying degrees by the health, occupational health and safety and environment agencies of government. Such agencies have also drawn on advice from the NHMRC.

Pollution standards exist for outside air and for the work place, but there are fewer standards for pollutant levels in the home. However, when homes have been monitored, pollutant levels indoors have sometimes exceeded "safe" outdoor or work levels.

An "acceptable" pollution level in your home may depend on such varied factors as:

- Whether or not family members have chronic illnesses especially respiratory or illnesses aggravated by pollutants.
- Whether there are children or elderly family members who may be more sensitive to pollutant effects.
- Whether products or materials used in the home produce pollutants and how often they are used.

It is important to make certain that our indoor air quality is of a sufficient standard to ensure the adequate protection of human health and well being. This is particularly the case as Australians may spend 90% or more of their time indoors. Further, it is generally accepted that poor indoor air quality can result in health problems, which may carry a substantial cost burden. The CSIRO ( Commonwealth Scientific and Industrial Research Organization ) estimates that the cost of poor internal air quality in Australia may be as high as \$ 12 billion per year.

Despite the long periods we spend indoors, relatively little research has been done on the quality of air in our homes, schools, recreational buildings, restaurants, public buildings and offices or inside cars. In recent years, comparative risk studies performed by the US EPA and its Science Advisory Board have consistently ranked indoor air pollution among the top five environmental risks to public health.

Indoor air quality is influenced by two major components: the amount and quality of outdoor air getting in, and indoor sources of emissions. The influence of outdoor air quality on indoor air quality depends on the air exchange rate; this varies with climate, lifestyle and building design.

## 3. Building-Related Illness (BRI)

The health impacts resulting from exposure to individual chemical substances in building

materials are not well understood. Many chemicals present in indoor air environments have not been evaluated thoroughly and little is known about their long-term health effects.

Building-related illness (BRI) is a clinically diagnosed illness directly related to indoor exposure (e. g. lung disease, cancer). "Sick building syndrome (SBS)" is a subset of BRI that comprises an excess of chronic symptoms. Raw (1992) summarized sick building syndrome symptoms as:

- irritated, dry or watering eyes (sometimes described as itching, tiredness, redness, burning, difficulty wearing contact lenses);
- irritated, runny or blocked nose (sometimes described as congestion, nosebleeds, itchy or stuffy nose);
- dry or sore throat (sometimes described as irritation, difficulty swallowing);
- dryness, itching or irritation of the skin, occasionally with rash;
- headache, tiredness or lethargy.

Indoor air quality can affect people's health and can have economic and legal implications. For example:

- Pollutants can cause or contribute to short and long-term health problems, including asthma, respiratory tract infections, allergic reactions, headaches, congestion, eye and skin irritations, coughing, sneezing, fatigue, dizziness and nausea.

- Indoor air pollutants can cause discomfort, and reduce attendance and productivity. Recent data suggest that poor IAQ can reduce a person's ability to perform specific mental tasks requiring concentration, calculation, or memory.

- Indoor air pollutants hasten building deterioration. For example, uncontrolled moisture can result in the structural decay of building components.

- Poor indoor air quality strains relationships among employees, family members, parents, teachers, students and school administrations.

- Indoor air quality problems can result in liability issues or lawsuits.

Today, IAQ problems can be identified through workplace inspections and an analysis of worker health concerns can help in identifications of IAQ problems. It is possible to control many health symptoms through effective building maintenance programs and by controlling specific air contaminants and their sources.

### New Words

concern [kən'sɜ:n] <i>vt.</i> 涉及, 关系到 <i>n.</i> (利害) 关系, 关心, 关注, 关注, 所关心的是	ergonomic [ˌɜ:ɡə'nɒmɪk] <i>adj.</i> 人类环境改造学的
contaminant [kən'tæmɪnənt] <i>n.</i> 致污物, 污染物	false [fə:ls] <i>adj.</i> 错误的, 虚伪的, 假的, 无信义的, 伪造的, 人工的, 不老实的 <i>adv.</i> 欺诈地
pollutant [pə'lju:tənt] <i>n.</i> 污染物质	susceptible [sə'septəbl] <i>adj.</i> 易受影响的, 易感动的, 容许……的 <i>n.</i> (因缺乏免疫力而) 易得病的人
environmental [ɪn'vaɪərən'mentl] <i>adj.</i> 周围的, 环境的 <i>n.</i> 环境论	

respiratory [ris'paiəretəri] *adj.* 呼吸的  
 cardiovascular [ˌkɑ:diəu'væskjulə] *adj.* 心脏血管的  
 substantial [səb'stænʃəl] *adj.* 坚固的, 实质的, 真实的, 充实的  
 recreational [rekri'eɪʃənəl] *adj.* 休养的, 娱乐的  
 diagnose [ˈdaɪəgnəʊz] *v.* 诊断  
 chronic [ˈkrɒnik] *adj.* 慢性的, 延续很长的  
 sufficient [sə'fɪʃənt] *adj.* 充分的, 足够的  
 syndrome [ˈsɪndrəʊm] *n.* 综合病症  
 symptom [ˈsɪmptəm] *n.* [医] [植] 症状, 征兆

congestion [kən'dʒestʃən] *n.* 拥塞, 充血  
 itching [ˈɪtʃɪŋ] *adj.* 贪得的, 痒的, 渴望的  
 rash [ræʃ] *adj.* 轻率的, 匆忙的, 鲁莽的  
*n.* [医] 皮疹  
 malaise [mə'leɪz] *n.* 不舒服  
 lethargy [ˈleθədʒi] *n.* 无生气  
 implication [ˌɪmpli'keɪʃən] *n.* 牵连, 含意, 暗示  
 deterioration [diˌtiəriə'reɪʃən] *n.* 变坏, 退化, 堕落  
 lawsuit [ˈlɔ:su:t] *n.* 诉讼 (尤指非刑事案件)

## Notes

1. Driving in cars, flying in planes, engaging in recreational activities, and being exposed to environmental pollutants all pose varying degrees of risk. 驾车、飞行、娱乐和处于污染的环境中, 都使我们遭受着不同程度的危险。

此句中有四个并列的动名词短语, driving in cars, flying in planes, engaging in recreational activities, and being exposed to environmental pollutants, 作句子的主语。

2. In addition, people who may be exposed to indoor air pollutants for the longest periods of time are often those most susceptible to the effects of indoor air pollution. 除此之外, 那些长期遭受室内空气污染的人时常最容易受到室内空气污染的影响。

此句为主系表结构, 句子的主语为 people, 后面有一个 who 引导的定语从句修饰; 表语为 those 指 those people。

## Exercises

1. Answer the following questions according to the text.

- (1) What does the "indoor air" mean?
- (2) What are the main symptoms of "sick building syndrome"?
- (3) What do you think an "acceptable" pollution level in your home is?
- (4) Why should people concern indoor air quality?

2. Translate the following into Chinese or English.

- (1) indoor air quality (IAQ) \_\_\_\_\_
- (2) building-related illness (BRI) \_\_\_\_\_
- (3) sick building syndrome (SBS) \_\_\_\_\_
- (4) 空气污染 \_\_\_\_\_
- (5) 室内环境 \_\_\_\_\_
- (6) 污染源 \_\_\_\_\_

3. Translate the sentences into Chinese.

- (1) People want their homes to be free from indoor air pollutants and toxic substances



that can affect the health of children and other family members.

- (2) Despite the long periods we spend indoors, relatively little research has been done on the quality of air in our homes, schools, recreational buildings, restaurants, public buildings and offices or inside cars.
- (3) Indoor air quality is influenced by two major components: the amount and quality of outdoor air getting in, and indoor sources of emissions.
- (4) Indoor air pollution, building-related illness, and "sick building syndrome" have received increased attention over the last several years.
- (5) Given the fact that many people spend as much as 90 percent of their time indoors, the health risk due to indoor air pollutants is a significant public health concern.

## 参考译文

### 第 I 部分 室内空气质量

#### 第 1 单元 室内空气质量的基本概念

当处理我们的日常生活的时候,我们的健康将面对多种危险。驾车、飞行、娱乐和处于污染的环境时,都使我们遭受着不同程度的危险。一些危险是不可避免的。我们选择接受的一些危险,是因为以别的方式做会限制我们想要的生活方式。而且如果我们有了机会做见识广的选择,我们是决定避免一些危险的。受室内空气污染的危险就是你能采取行动的

##### 1. 室内空气质量 (IAQ) 问题

在 1976 年,工业卫生学家开始调查 IAQ 问题。自那时起 IAQ 问题持续增加。室内的空气质量已经成为重要的职业健康和安全争议。在 1970 年早期的能源保护措施时常导致减少室外的空气吸入,并且增加了建筑物内部产生空气污染的潜在性。

当化学和生物污染物达到一定水平,建筑物内就出现了室内空气质量 (IAQ) 问题,对于建筑物使用者就产生许多不利的影响。下列症状是一些较普遍的健康影响:头痛、反胃、疲累、困倦、头昏眼花、呼吸器官的问题、胸闷、咽喉干燥、皮肤湿疹、眼睛干痒、鼻塞、流涕、注意力不集中和不舒服的感觉。

工作场所的噪声、照明不充分、热环境不合适和室内环境问题也是引起身体不适的原因,但是有时人们也把它们错误地被归因于空气中化学或生物的污染物所引起的问题。

因为这些症状是可变的和主观的,所以,过去这些建筑使用者报告的症状时常被认为是心理学问题,因为很难准确确定原因。很难证明这些症状与特定的室内空气污染物有关。事实上,建筑物使用者同时被暴露于很大范围的室内空气污染物中。

在最近几年中,越来越多的科学证据已经指出,家和其他的建筑物里面的空气污染程度比最工业化的城市室外污染还严重。其他的研究指出人在室内花费大约他们 90% 的时间。因此,对于许多人来说,在室内遭受的健康的危险比在室外还多。

人们希望他们的家没有室内空气污染物和能影响孩子和其他家庭成员健康的有毒物质。你在室内要度过 80%~90% 的时间,而且你的家庭成员也处于可能被污染物影响的环境中。除此之外,那些长期遭受室内空气污染的人时常最容易受到室内空气污染的影响。这些人群包括年幼者、老年人和慢性病人,尤其正在罹患呼吸器官或心脏血管疾病的人。

## 2. 室内空气污染标准

NHMRC(澳大利亚国家健康和医药研究委员会)定义“室内空气”为一个人在一天中度过1小时或更久的任何非工业的室内空间的空气。这些空间包括办公室、教室、车辆、购物中心、医院和家。

在历史上,室内的空气质量已经受到政府部门不同程度的重视,如政府的健康、职业健康、安全和环境部门。这些部门也已经得到来自 NHMRC 的建议和忠告。

室外工作场所的空气污染标准已经制定,但是有关家中空气污染物质的标准较少。然而,当检测家中室内空气的时候,发现室内污染物质的水平有时有超过室外的或工作场所的安全水平。

在家中,一个可接受的污染水平可以取决于下列不同的因素,例如:

- 你的家庭成员是否有慢性疾病,尤其是呼吸器官的或被污染物质加重的疾病;
- 是否有孩子或老年家庭成员对污染物质的影响更敏感;
- 是否在家中使用的产品或材料产生污染物质,它们被使用的频次如何。

确定我们的室内空气质量的严格标准以确保人类健康和生存环境是非常重要的。特别是澳洲人可能在室内花费 90% 或更多的时间,情况更是如此。更进一步地,人们通常认为,不佳的室内空气质量能造成健康问题,这可能造成可观的费用负担。CSIRO(澳大利亚联邦科学与工业研究组织)估计在澳洲由于不佳室内空气质量所花的费用可能高达每年一百二十亿元。

尽管我们长期生活在室内,但是我们对家、学校、娱乐场所、餐馆、公共建筑、办公室或汽车内的空气质量研究较少。近几年来,美国环保署和它的科学情况报告董事会已经一致地将室内空气污染危害排列在对公共健康产生的危害的前五名之中。

影响室内的空气质量有两个主要的成分:由室外进入室内的空气的数量和质量;室内物质散发的气体的质量。室外空气质量对室内的空气质量的影响力取决于空气交换率;空气交换率随着气候、生活方式和建筑物设计的不同而改变。

## 3. 建筑相关疾病(BRI)

人们对建材中化学物质对健康的影响还不甚了解。许多存在于室内空气环境中的化学物质还没有被彻底地评估,而且它们对健康的长期影响也很少被人们所了解。

建筑相关疾病(BRI)被临床诊断为与室内空气污染直接有关的一种的疾病(例如肺疾病,癌症)。“病态建筑综合征(SBS)”是BRI的组成部分,它包含许多慢性症状。Raw将症状概述为:

- 眼睛刺痛、干燥的或流泪(有时被描述为眼睛痒、疲劳、红、灼烧,很难佩戴隐形眼镜);
- 鼻子刺痛、流鼻涕,或者鼻子不通(有时被描述为鼻充血、鼻流血、鼻塞的或鼻塞);
- 喉咙干或喉咙痛(有时被描述为咽喉刺痛、吞咽困难);
- 皮肤干燥、搔痒或皮肤刺痛,有时候有皮疹;
- 头痛,疲劳或昏睡。

室内的空气质量能影响人们的健康,也能产生经济和法律方面问题。例如:

- 污染物质能引起短期或长期的健康问题,包括哮喘、呼吸器官的感染、过敏性反应、头痛,充血、眼睛和皮肤刺激、咳嗽、打喷嚏、疲累、头昏眼花和反胃。
- 室内的空气污染物质能引起身体不适,而且减少出勤和降低生产效率。最近的研究数

据表明, 不良的室内空气质量能够降低人们完成特定的脑力劳动的能力, 而完成这些脑力劳动就需要集中注意力, 具有计算能力和记忆力。

- 室内的空气污染物加快了建筑的损坏。举例来说, 未经控制的湿气能造成对建筑成分的结构损坏。

- 不良的室内空气质量可以造成职员、家庭成员、父母、老师、学生和学校行政管理人员之间关系的紧张。

- 室内空气质量问题还可以引起责任争议或诉讼。

今天, IAQ 问题可以通过对工作地点的检测而确定, 而且针对工人健康问题的分析也有助于 IAQ 问题确定。通过有效的建筑物维护方案和通过控制特定的空气污染物及其来源, 都可以减少许多健康方面的不良症状。

## Reading Material

### Do You Suspect Your Office has an Indoor Air Problem?

As the public recognizes the importance of healthy, comfortable, and productive indoor environments, their awareness and demand for good indoor air quality (IAQ) increases. This demand has resulted in IAQ emerging as a major concern in office buildings. Many office buildings have significant indoor air pollution sources. These sources include furnishings, occupant activities, housekeeping practices, pesticide applications, and microbial contamination. A factor greatly influencing the effect of these sources and the overall quality of indoor air in offices is the ventilation system design, operation and maintenance. People generally have less control over the indoor environment in their offices than they do in their homes. As a result, there are large numbers of reported health problems associated with office buildings.

#### 1. Health Effects

A number of well-identified illnesses, such as Legionnaire's disease, asthma, hypersensitivity pneumonitis, and humidifier fever, have been directly traced to specific building problems. These are called building-related illnesses. Most of these diseases can be treated; nevertheless, some pose serious health risks and may require prolonged recovery times after leaving the building.

Sometimes, however, building occupants experience symptoms that do not fit the pattern of any particular illness and are difficult to trace to any specific source. People may complain of one or more of the following symptoms: dry or burning mucous membranes in the nose, eyes, and throat; sneezing; stuffy or runny nose; fatigue or lethargy; headache; dizziness; nausea; irritability and forgetfulness. These symptoms may or may not be related to poor indoor air quality. Poor lighting, noise, vibration, thermal discomfort, and psychological stress may also cause, or contribute to, these symptoms. There is not single manner in



which these health problems appear. The complaints may be localized in a particular room or zone, or may be widespread throughout the building. When most of the complainants report relief of these symptoms soon after leaving the building, the phenomenon has been labeled sick building syndrome.

In the opinion of some World Health Organization experts, up to 30 percent of new or remodeled buildings worldwide may be the subject of excessive complaints related to indoor air quality.

## **2. What causes problems?**

Three major reasons for poor indoor air quality in office buildings are the presence of indoor air pollution sources; poorly designed, maintained, or operated ventilation systems; and uses of the building that were unanticipated or poorly planned for when the building was designed or renovated.

## **3. Sources of Office Air Pollution**

As with homes, the most important factor influencing indoor air quality is the presence of pollutant sources. Commonly found office pollutants and their sources include environmental tobacco smoke; asbestos from insulating and fire-retardant building supplies; formaldehyde from pressed wood products; other organics from building materials, carpet, and other office furnishings, cleaning materials and activities, restroom air fresheners, paints, adhesives, copying machines, and photography and print shops; biological contaminants from dirty ventilation systems or water-damaged walls, ceilings, and carpets; and pesticides from pest management practices.

## **4. Ventilation Systems**

Mechanical ventilation systems in large buildings are designed and operated not only to heat and cool the air, but also to draw in and circulate outdoor air. If they are poorly designed, operated, or maintained, however, ventilation systems can contribute to indoor air problems in several ways.

For example, problems arise when, in an effort to save energy, ventilation systems are not used to bring in adequate amounts of outdoor air. Inadequate ventilation also occurs if the air supply and return vents within each room are blocked or placed in such a way that outdoor air does not actually reach the breathing zone of building occupants. Improperly located outdoor air intake vents can also bring in air contaminated with automobile and truck exhaust, boiler emissions, fumes from dumpsters, or air vented from restrooms. Finally, ventilation systems can be a source of indoor pollution themselves by spreading biological contaminants that have multiplied in cooling towers, humidifiers, dehumidifiers, air conditioners, or the inside surfaces of ventilation duct work.

## **5. Use of the Building**

Indoor air pollutants can be circulated from portions of the building used for specialized