全国高等医药院校试用教材

英语

下册

（药学、化学制药、中药专业用）

南京药学院 主编

上海科学技术出版社

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主　　编

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编　写　单　位

南京药学院　沈阳药学院　北京医学院

四川医学院　上海第一医学院

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编 写 说 明

本教材为卫生部组织编写的全国药学院校系英语统编教材，供药学、化学制药、中药等专业使用。本教材分上、下两册。上册为基础部分（160学时左右），下册为专业阅读部分（100学时左右）。

下册共30课，都是有关化学和药学的文章，这些文章绝大部分选自国外英文原著。词汇总量近1400。书后附有“专业文献选译”和“构词法”两个附录。专业文献选译共8篇，每篇后均附有汉译。

参加本教材编写的有下列同志：许南蛙（川医）、陆波（南药）、陈永德（上一医）、张筱卿（南药）、周璐玲（北医）、胡廷熹（南药）、赵威伯（沈药）。

本教材承上海第一医学院外语教研组杨昌毅同志提出不少宝贵意见，在此表示感谢。

恳切希望使用本教材的同志和读者提出批评和意见，以便进一步修订。

1979年6月

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Lesson One

What Things Are Made of

There are many different kinds of things in the world around you. Everything you see is made of some kind of material. The chair you sit on is made of wood. The pages of this book are made of paper. You ride in an automobile that is made of steel, glass, rubber, and many other things.

There are many different kinds of materials. There are soft ones like silk and feathers and fur. There are hard ones like wood and rock and steel. There are runny ones like water and oil. There are smoky ones like steam from a tea kettle and clouds in the sky.

You can see most of these materials, and you can feel many of them, too. You know them well. But do you know what they are really made of?

Suppose you look through a microscope that can show things a hundred times bigger than they really are. Then you would see that a piece of hard, bright steel has bumps and holes all over it. Your microscope makes silk cloth look like a thick web of soft, shiny silk ropes.

Now you want to make things look even much bigger than this. You want to find out what things are made of, deep down inside. So pretend that you have a very special microscope that makes things look a million times bigger.

If you could look at a hard piece of steel through your special microscope, what would you see?

You would see nothing but millions and millions of tiny specks, and the specks would be jumping and shaking and jiggling around like a busy swarm of bees. It is hard to believe that a piece of smooth, hard steel is really made up of nothing but darting little dots!

No matter what you look at in your special microscope, you see only tiny, jiggling specks. Look at hard things or soft things. Look at runny things or smoky things. You see only busy little specks rushing around, never stopping.

Scientists have a name for these specks. They call them molecules. Everything you ever saw is made up of molecules. Everything in the world is made up of molecules, even the sun and the moon and the stars. And you are made up of molecules, too. Your body has many materials in it, and each one is different from all the others. Each material in the world is different because it is made up of its own special kind of molecule.

Of course there is no special microscope that can make things look a million times bigger. But scientists do not need one. They have special ways of finding out that there really are such things as molecules. Scientists can measure molecules. They can count them. They can even weigh them.

Look at the period at the end of this sentence. It is just a little black dot. But there is room enough for a row of five million molecules across it, dancing side by side.

Suppose you were only as tall as a molecule. Then the point of a pin would be like a big, round hill. And there would be room on that hill for you and all the other people in the world.

New Words and Expressions

1. chair [tʃɛə] *n.* 椅子
2. sit [sit] *vi.* 坐
   (sat [sæt])
3. ride [raid] *v.* 骑；乘
   (rode [roud], ridden ['ridn])
4. automobile ['ɔ:təməbi:l] *n.* 汽车
5. steel [sti:l] *n.* 钢
6. rubber ['rʌbə] *n.* 橡皮，橡胶
7. soft [sɔft] *a.* 柔软的
8. silk [silk] *n.* 丝；绸
9. feather ['feðə] *n.* 羽毛
10. fur [fə:] *n.* 毛皮
11. rock [rɔk] *n.* 岩石
12. runny ['rʌni] *a.* 流动的
13. smoky ['smouki] *a.* 冒烟的；烟状的
14. sky [skai] *n.* 天空
15. microscope ['maikrəskoup] *n.* 显微镜
16. bump [bʌmp] *v.* 撞，撞击
    n. 隆起部分
17. hole [houl] *n.* 洞，孔
18. cloth [klɔ(:)θ] *n.* 布；织物
19. thick [θik] *a.* 厚的；粗的；粘稠的
20. web [web] *n.* 网；网状物
21. shiny ['ʃaini] *a.* 发亮的，有光泽的
22. rope [roup] *n.* 绳子
23. deep [di:p] *ad.* 深
    a. 深的
24. pretend [pri'tend] *vt.* 假装；假设
25. nothing but 只有；只不过
26. speck [spek] *n.* 斑点；微粒
27. jump [dʒʌmp] *vi.* 跳
28. shake [ʃeik] *v.* 摇动，抖动，振摇
    (shook [ʃuk], shaken ['ʃei kən])
    n. 摇动，振摇
29. jiggle ['dʒigl] *v.* 轻轻摇晃；跳动
30. busy ['bizi] *a.* 忙，热闹，紧张
31. swarm [swɔ:m] *n.* 群
    v. 密集，充满
32. bee [bi:] *n.* 蜜蜂
33. smooth [smu:ð] *a.* 光滑的，平稳的
34. dart [dɑ:t] *vi.* 急冲
35. dot [dɔt] *n.* 小点，圆点
36. count [kaunt] *vt.* 数
37. period ['piəriəd] *n.* 周期；时期；句号
38. sentence ['sentəns] *n.* 句子；判决
39. row [rou] *n.* 排
40. across [ə'krɔs] *prep.* 横过，穿过
41. dance [dɑ:ns] *v.* 跳舞；摇晃
42. side [said] *n.* 边，旁边，方面
    side by side 并肩地
43. tall [tɔ:l] *a.* 高的
44. pin [pin] *n.* 别针，大头针
45. point [pɔint] *n.* 尖，尖端；点
46. hill [hil] *n.* 小山，丘陵

Lesson Two

Why Do We Eat and What Should We Eat?

Our bodies are very complex and intricate organisms. We can maintain ourselves and perform our normal functions only within a limited temperature range. As you know, the normal temperature of an adult human being is 98.6°F. This temperature must be maintained by the body in spite of external temperature changes. To do this, the body must generate heat and also produce enough energy to enable it to perform such important biological processes as muscular motion, digestion, breathing, circulation of blood, etc. To obtain this energy, everyone eats, or takes in, food. Lavoisier first explained accurately how body temperature is maintained by the oxidation of food. Oxidation is a rather simple process, but hundreds of other complex chemical processes are necessary to convert the food we eat into the substances necessary for the normal functioning of the human body. Foods are required also in building new tissue and in repairing broken-down or worn-out cells. In a sense, man is a parasite; we do not synthesize foods in our bodies — but rather we reconstruct them from the various organic and inorganic materials which we consume.

In the course of your lifetime probably you will consume some fifty tons of food (estimated average normal food consumption). The chief nutrients found in this fifty tons of food are carbohydrates, fats and oils, proteins, minerals, and vitamins. Water, even though it does not produce energy since it is already completely oxidized, is absolutely essential for the proper working of your body. A lack of the minimum amount of water will upset the proper concentrations of the various fluids in your body and will cause many organs to fail to function normally.

Carbohydrates make up part of our diet. A carbohydrate is an organic compound composed of carbon, hydrogen, and oxygen. In a carbohydrate, hydrogen and oxygen are present in the same ratio as in water, that is, two atoms of hydrogen to one of oxygen. The most common carbohydrates are the sugars, and the starches.

Fats and oils also constitute part of our diet. These nutrients contain carbon, hydrogen, and oxygen in varying proportions. Animal and vegetable fats and oils are mixtures of esters. Those mixtures of esters which are liquid under normal conditions are called oils; those which are solid are generally called fats. They serve as secondary sources of energy in the body, and also as insulation for various body tissues.

Proteins are very complex nitrogen compounds. Carbohydrates and fats are the chief sources of energy used in the activities of the body but they are not the chief substances of which active body tissues are composed. Muscle tissue, for example, contains but little carbohydrate and often very little fat. The chief constituents of the muscles

and of the protoplasm of plant and animal cells generally are compounds called proteins. Proteins are distinguished from carbohydrates and fats by the presence of nitrogen, for proteins contain about 16% of nitrogen.

The minerals of the body constitute more than 4% of the weight of the body. Animal tissues contain compounds of calcium, magnesium, sodium, iron, potassium, sulfur, phosphorus, chlorine, iodine, and traces of copper, manganese, zinc, aluminum, silicon, fluorine, and other elements. These elements are obtained from foods. These foods become part of different body tissues.

New Words and Expressions

1. intricate ['intrikit] *a.* 复杂的,错综的
2. maintain [men'tein] *v.* 维持,保持
3. perform [pə'fɔ:m] *vt.* 执行,履行;表演
4. limited ['limitid] *a.* 有限的
5. range [reindʒ] *n.* 范围;一系列
   v. 排列;延伸
6. adult ['ædʌlt] *n.* 成年人
7. generate ['dʒenəreit] *vt.* 生殖;发生,产生
8. biological [ˌbaiə'lɔdʒikəl] *a.* 生物学(上)的
9. muscular ['mʌskjulə] *a.* 肌肉的
10. circulation [ˌsə:kju'leiʃən] *n.* 循环;运行;流通;发行
11. Lavoisier [lavwazi'ei] (人名)(法国化学家)
12. repair [ri'pɛə] *vt.* 修理
13. broken-down ['broukən 'daun] *a.* 衰弱之极的,快垮掉的
14. worn-out ['wɔ:n 'aut] *a.* 用坏的,穿旧的,不能再用的
15. parasite ['pærəsait] *n.* 寄生虫,寄生菌,寄生物
16. reconstruct ['ri:kən'strʌkt] *vt.* 再建,重建
17. consume [kən'sju:m] *vt.* 消费;消耗
18. estimate ['estimeit] *vt.* 估计
19. consumption [kən'sʌmpʃən] *n.* 消费(量),消耗
20. nutrient ['nju:triənt] *a.* 营养的,滋养的
    n. 营养品
21. carbohydrate ['kɑ:bou'haidreit] *n.* 碳水化合物
22. oil [ɔil] *n.* 油
23. lack [læk] *vt.*, *n.* 缺乏
24. minimum ['miniməm] *n.* 最小量,最低限度
25. upset [ʌp'set] *vt.* 弄翻;打乱
    (upset)
26. concentration [kɔnsen'treiʃən] *n.* 浓度;浓缩;集中
27. fluid ['flu(:)id] *n.* 流体;流质
28. constitute ['kɔnstitju:t] *vt.* 组成,制定
29. vary ['vɛəri] *v.* 改变,变化
30. ester ['estə] *n.* 酯
31. secondary ['sekəndəri] *a.* 第二位的;次要的;仲
32. insulation [ˌinsju'leiʃən] *n.* 隔离;绝缘
33. muscle ['mʌsl] *n.* 肌肉
34. protoplasm ['proutəplæzm] *n.* 原生质;细胞质
35. silicon ['silikən] *n.* 硅
36. fluorine ['flu(:)əri:n] *n.* 氟

Lesson Three

Extraction

Perhaps the earliest method for isolating useful organic compounds from natural sources was extraction. Extraction of sugar, the earliest example of this method might be traced to prehistoric times. Sucrose, or cane sugar, was extracted from the cellulosic material of the cane stalk with water, and upon evaporation of the water, the sugar crystallized. Another very important example of isolation was the extraction of quinine, the highly effective antimalarial drug. Quinine is a product extracted from the bark of the cinchona tree. Legend places its discovery prior to 1633 as the result of a violent storm.[1] Fallen cinchona trees in a pool made the water so bitter that local residents refused to drink it. However, a stranger passing through, having a burning fever and finding no other, was forced to drink it and he was cured.

The principle of extraction, of course, has its basis in the fact that compounds differing greatly in their structural characteristics are quite likely to differ greatly in their chemical and physical characteristics as well. Thus, it is not surprising that one compound may be very soluble in water while other compounds accompanying it in the natural environment may be very insoluble. Consequently, an extraction process using water as the solvent would lead to an effective separation and isolation of the water-soluble component. Quite often, the solvent-soluble fraction is a mixture, and other methods of isolation of pure compounds must be utilized.

Solvent extraction is a method of separation based on the transfer of a solute from one solvent into another, essentially immiscible solvent when the two solvents are brought into contact. The reason for the large popularity of solvent extraction lies in the speed, ease, and convenience of the technique. The separations are clean because the relatively small interfacial area between the two liquid phases avoids any effects analogous to the undesirable coprecipitation phenomena that plague most precipitation separations. In most cases a simple separatory funnel is all the apparatus required. The extraction step usually requires only several minutes to carry out, and the procedures are applicable to both trace and macro levels. Many sensitive organic and biochemical materials can be separated by extraction procedures with much less danger of decomposition than is present with other separation processes.

No technique is more widely used for the separation of an organic product from its reaction mixture or for the isolation of naturally occurring organic substances than extraction. Just for this reason, extraction techniques have been developed to a high degree of specialization, and more extensive discussions can be found in suitable sources. Elaborations, such as the use of boiling solvents, mixed solvents, multiple extractions,

and solid-liquid and liquid-liquid extractions are commonplace in the laboratory.

New Words and Expressions

1. perhaps [pə'hæps, præps] *ad.* 也许，可能
2. isolate ['aisəleit] *vt.* 分离，隔离
3. isolation [ˌaisə'leiʃən] *n.* 分离；隔离
4. trace [treis] *vt.* 追溯，追迹
   n. 痕迹，痕量，微量
5. prehistoric ['pri:his'tɔrik] *a.* 历史以前的，史前的
6. cane [kein] *n.* 甘蔗；棍棒
7. cellulosic [ˌselju'lɔsik] *a.* 纤维(素)的
8. stalk [stɔ:k] *n.* (草本植物的)主茎
9. crystallize ['kristəlaiz] *v.* 结晶
10. quinine ['kwinin] *n.* 奎宁
11. antimalarial ['æntimə'leəriəl] *a.* 抗疟疾的
12. bark [bɑ:k] *n.* 茎皮，树皮
13. cinchona [siŋ'kounə] *n.* 金鸡纳树属
14. tree [tri:] *n.* 树
15. legend ['ledʒənd] *n.* 传说
16. prior ['praiə] *a.* 在前的，优先的
    ad. 在前，优先
    prior to 在……前
17. violent ['vaiələnt] *a.* 剧烈的，猛烈的
18. storm [stɔ:m] *n.* 暴风雨
19. fall [fɔ:l] *vi.* 落下，跌落
    (fell [fel], fallen ['fɔ:lən])
20. pool [pu:l] *n.* 池，塘
21. bitter ['bitə] *a.* 苦的
22. local ['loukəl] *a.* 局部的；地方的；当地的
23. resident ['rezidənt] *n.* 居民
24. refuse [ri'fju:z] *vt.* 拒绝
25. drink [driŋk] *vt.* 喝
    (drank [dræŋk], drunk [drʌŋk])
26. stranger ['streindʒə] *n.* 陌生人
27. fever ['fi:və] *n.* (发)烧，(发)热
28. force [fɔ:s] *v.* 迫使，强制
29. structural ['strʌktʃərəl] *a.* 结构上的
30. as well 也，同样
31. surprise [sə'praiz]
    vt. 使感到意外，使惊奇
    n. 惊奇，诧异
32. environment [in'vaiərənmənt] *n.* 环境
33. separation [ˌsepə'reiʃən] *n.* 分离
34. component [kəm'pounənt] *n.* 组成部分，成分
35. fraction ['frækʃən] *n.* 小部分；(分)馏(部)分；分数
36. transfer ['trænsfə:] *n.* 转移，变换
37. popularity [ˌpɔpju'læriti] *n.* 通俗性；普及，流行
38. lie [lai] *vi.* 躺；位于；在
    (lay [lei], lain [lein]; lying ['laiiŋ])
    lie in 在于
39. ease [i:z] *n.* 容易；不费力
40. convenience [kən'vi:njəns] *n.* 便利，方便
41. interfacial [ˌintə'feiʃəl] *a.* 界面的
42. area ['ɛəriə] *n.* 地面，面积，领域
43. avoid [ə'vɔid] *v.* 回避，避免
44. analogous [ə'næləgəs] *a.* 相似的，类似的
45. coprecipitation [ˌkouprisipi'teiʃən] *n.* 共沉淀
46. plague [pleig] *v.* 传染瘟疫；使苦恼
    n. 瘟疫
47. separatory ['sepərətəri] *a.* 分离用的
48. funnel ['fʌnəl] *n.* 漏斗
49. apparatus [ˌæpə'reitəs] *n.* 仪器，设备，装置
50. step [step] *n.* 步骤，脚步，台阶

51. carry out 实现，执行，进行
52. applicable ['æplikəbl] *a.* 能应用的，可适用的
53. macro ['mækrou] *a.* 巨大的
54. danger ['deindʒə] *n.* 危险
55. decomposition [di:kɔmpə'ziʃən] *n.* 分解
56. specialization [ˌspeʃəlai'zeiʃən] *n.* 特殊化，专门化
57. suitable ['sju:təbl] *a.* 合适的，适当的
58. elaboration [iˌlæbə'reiʃən] *n.* 精心操作
59. commonplace ['kɔmənpleis] *a.* 平凡的 *n.* 平凡事物

Notes to the Text

1. Legend ... a violent storm.

全句译为：传说它的发现是在 1633 年以前，是一次强烈的暴风雨的结果。

Lesson Four

Distillation

Distillation, a method used for the separation of the components of liquid mixtures, depends on the distribution of constituents between the liquid mixture and the vapor in equilibrium with the mixture. The two phases exist by formation of the vapor phase through partial evaporation of the liquid mixture. Each phase can be recovered separately with the more volatile components concentrated in the vapor, while the less volatile ones are in greater concentration in the liquid. The effectiveness of the separation is dependent on the physical properties of the components in the mixture, the equipment used, and the method of distillation.

A number of different distillation methods, or processes, are used in both laboratory and pilot-plant research, as well as in commercial production of chemicals and related products. The separation of liquid mixtures by distillation is one of the most important and widely used processes in the chemical industry today.

Distillation can be distinguished from evaporation in that it is the separation of a mixture in which all components are volatile, whereas in evaporation volatile components are separated from nonvolatile ones.[1] For example, distillation would be used to separate a mixture of alcohol and water, but evaporation would be employed to separate water from an aqueous sodium chloride solution.

Conventional distillation is carried out by two methods. The first consists of producing vapor by boiling the liquid mixture to be separated, and then condensing and collecting these vapors without returning them to the still pot. This method is commonly referred to as simple distillation. The second method, and the one most widely used, is based on the return of a portion of the vapor condensate to the distillation unit under such conditions that this condensate is continuously and countercurrently in contact with the vapors.[2] The liquid portion returned is referred to as reflux, and the method is called fractional distillation or rectification.

In addition to the two conventional methods of distillation mentioned—simple and fractional — there are a number of more specialized types adaptable to particular mixtures, conditions, and applications. Flash distillation consists of vaporizing instantaneously and continuously a definite fraction of the liquid mixture in such a way that the total vapor produced is in equilibrium with the residual liquid.[3] This method is ordinarily used for a mixture containing components with widely different boiling points.

Vacuum (reduced-pressure) distillation is ordinarily used to separate high boiling mixtures of materials that decompose below their normal boiling points. Decreased pressure reduces these boiling-point temperatures.

Steam distillation is another special method utilized to separate high-boiling mixtures

or to separate a material from a nonvolatile impurity. This method utilizes rather simple and inexpensive equipment.

Azeotropic and extractive distillations are used for mixtures that are difficult to separate. These methods find their principal use in the separation of mixtures whose components boil too close together for economic conventional fractional distillation.

Sublimation can be classed as a highly specialized distillation method, in that it is used as a purification method, and the desired product can be either the sublimed or the residual material.

New Words and Expressions

1. equilibrium [ikwi'libriəm] *n.* 平衡
   in equilibrium with... 与……平衡
2. partial ['pɑ:ʃəl] *a.* 部分的
3. separately ['sepəritli] *ad.* 分别地，分开地
4. concentrate ['kɔnsentreit] *v.* 浓缩；集中
5. effectiveness [i'fektivnis] *n.* 效果，有效性
6. equipment [i'kwipmənt] *n.* 设备
7. pilot ['pailət]
   a. 引导的；小规模试验性的
   n. 飞行员
   pilot-plant ['pailət plɑ:nt] *n.* 小规模试验厂
8. commercial [kə'mə:ʃəl] *a.* 商业(上)的
9. chemical ['kemikəl] *n.* 化学制品，化学药品
10. related [ri'leitid] *a.* 有关的
11. whereas [(h)wɛər'æz] *conj.* 而，却，反之
12. nonvolatile [nɔn'vɔlətail] *a.* 不挥发的
13. aqueous ['eikwiəs] *a.* 水的，水状的
14. conventional [kən'venʃənl] *a.* 惯例的，常规的
15. return [ri'tə:n] *v.* 收回，归还，返回
    n. 回来，返回
16. still [stil] *n.* 蒸馏室，蒸馏器
17. pot [pɔt] *n.* 罐；锅；壶
18. condensate [kən'denseit] *n.* 冷凝物，冷凝液
19. unit ['ju:nit] *n.* 单位，单元；部件；装置
20. continuously [kən'tinjuəsli] *ad.* 不断地，继续地
21. countercurrently ['kauntə'kʌrəntli] *ad.* 逆向地，相向地
22. reflux ['riflʌks] *n.* 回流，回流物
23. rectification [ˌrektifi'keiʃən] *n.* 精馏
24. addition [ə'diʃən] *n.* 增加，加成
    in addition to ... 除……以外
25. specialize ['speʃəlaiz] *vt.* 专门化
26. adaptable [ə'dæptəbl] *a.* 适应性强的，能适应的
27. application [ˌæpli'keiʃən] *n.* 应用，申请
28. flash [flæʃ] *a.* 火速的，急骤的
    flash distillation 急骤蒸馏，闪蒸
29. vaporize ['veipəraiz] *v.* 蒸发，汽化
30. instantaneously [ˌinstən'teinjəsli] *ad.* 瞬间地，即刻地
31. residual [ri'zidjuəl] *a.* 残留的，残渣的
32. ordinarily ['ɔ:dinərili] *ad.* 普通地，平常
33. azeotropic [əˌzi:ə'trɔpik] *a.* 共沸的，恒沸点的
34. extractive [iks'træktiv] *a.* 提取的
    n. 提取物
35. economic [ikə'nɔmik] *a.* 经济的
36. class [klɑ:s] *vt.* 分类
37. desire [di'zaiə] *v.* 愿望，希望，要求
    n. 愿望
38. sublime [sə'blaim] *v.* 升华

Notes to the Text

1. Distillation can be distinguished from evaporation in that it is ... are separated from nonvolatile ones.

全句译为：蒸馏与蒸发的区别就在于蒸馏所分离的各种组分都是挥发性的混合物，而蒸发则是把挥发性的与不挥发性的组分加以分离。

2. The second method, ... in contact with the vapors.

全句译为：第二种方法，也是用得最广泛的一种方法，它的原理是部分的蒸汽冷凝液回流到蒸馏装置中，使其连续地逆向地与蒸汽接触。

3. Flash distillation consists of ... in such a way that the total vapor produced is in equilibrium with the residual liquid.

句中 in such a way 作状语形容 vaporizing, that 引出状语从句，全句译为：

急骤蒸馏就是连续地使一定部分的液体混合物在瞬间汽化，使其所产生的全部蒸汽与剩余液体处于平衡状态。

Lesson Five

Criteria of Purity of Organic Compounds

Once the organic chemist has made an effort to purify a compound, he must have available methods of detecting impurities, that is, of determining how effective the purification methods have been. Of course, if the compound has previously been isolated and characterized, a favorable comparison of its observed physical and chemical properties with those previously described is an adequate proof of its identity. It is only in those cases which involve isolation of new compounds that such methods are absolutely essential.[1] Several criteria of purity are available.

Constant Melting Point. The observations of F. M. Raoult and J. H. van't Hoff (which led to formulation of the well-known van't Hoff solution laws) that the presence of impurities in a substance usually lowers its melting point (or freezing point) have been used effectively as a criterion of purity. During a series of recrystallizations, each followed by a melting point determination, as elimination of impurities is being completed by the process, the melting point will approach a constant value (all temperatures are centigrade (C) unless otherwise designated[2] in the text). When this has been attained, the compound may often be assumed to be relatively free of impurity.

Constant Analytical Data. Pure chemical compounds have a constant composition by weight, and this fact can be used as a criterion of purity. However, in practice, other methods are more conveniently used, since a quantitative analysis for the elements present is quite time-consuming. If, after each of several successive purification steps, the analytical data reveal a constant composition by weight, one of two conclusions can be drawn. Either the compound has been obtained in a high state of purity or the purification procedures are not effecting separation of the compound from the impurities. Other criteria of purity must be applied to permit selection between the two possibilities.

Constant Boiling Point. For liquids, a constant boiling point is recognized as one criterion of purity. However, in practice, it is customary to use boiling point as only a rough guide to purity. The theoretical basis for the relationship between purity and boiling point lies in the principle outlined in the van't Hoff solution laws.

Constant Refractive Index. The refractive index of a liquid is defined as the relative rate of transmission of light through the liquid when compared to air. The lower velocity of light through a liquid causes refraction of the light and refractometers are designed to measure this refraction.

Gas-liquid Chromatography as a Criterion of Purity. Gas-liquid chromatography was introduced in 1952, and it has since been proved to be the most effective and convenient technique for detecting impurities in compounds. Its convenience lies in the facts that