

**化学专业
英语文献
阅读指南**

江苏科学技术出版社

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编译

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前 言

编译本书的目的，是使读者通过学习能够比较顺利地阅读有关化学专业英语文献。本书选择的内容比较广泛，涉及无机化学、有机化学、分析化学、物理化学等方面的基本知识和一些实验知识。我们在编译本书时，尽量注意内容由浅入深，同时便于读者记忆，也注意到词汇的再现性。

全书共四十课。每课除正文外，还有单词、词组、注释和译文。读者可参照词汇阅读课文，根据注释理解课文。每课后的译文，供读者学习时参考。

本书可供化学专业学生使用，也可供化学科技人员自修阅读。

参加本书编译的有张才芬、冯桂荣、许文鏢、孟荣华同志。许文琳同志仔细审校了本书。限于编者的水平，错误不妥之处，敬希读者批评指正。

编 者

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	铜	
	(2) Zinc	

锌

(3) Manganese

锰

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(1) Order of a Reaction

反应级数

(2) Activation Energy

活化能

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1. Elements, Compounds and Mixtures

單質

化合物

混合物

There are two classes of substances, elements* and compounds. Elements are ^{unmixed with any other substances} pure substance which ^{separate into its parts} can not be decomposed by a chemical change.

Every substance that ^{happen} occurs ^{天然地} naturally in the world ^{made up of} consists of one or more of about 90 elements¹; another 17 elements have been made artificially during the past few years. Some common elements are oxygen, nitrogen, carbon, iron, copper and other metals. Many elements are rare and we never see them in everyday life.

The earth's crust is the thin layer, a few miles deep, on the outside of the earth. The percentages of the common elements present in this crust and in the waters on it are,

Oxygen	50%	Calcium ^{Ca}	3%
Silicon ^{Si}	26%	Sodium ^{Na}	2.5%
Aluminium	7%	Potassium ^K	2.5%
Iron	4%	Magnesium ^{Mg}	2%

These 8 elements make up about 97% of the crust; the other 84 elements make up only 3% of the crust. Copper, lead and zinc are not in the above list, and neither are carbon and nitrogen², which are

essential for living things. Oxygen occurs free in the atmosphere, and is present in water, oxides, carbonates and sulphates. Silicon occurs in sand (silicon dioxide, SiO_2) and as silicates in many rocks, e.g. granite. Clay is hydrated aluminium silicate.

A compound is a substance which consists of two or more elements chemically combined together.

Water is a compound of the elements hydrogen and oxygen; common salt is a compound of sodium and chlorine; sugar and alcohol are compounds of hydrogen, oxygen and carbon. About two million compounds are known.

Although there are only 107 known elements, here are a great many chemical compounds in nature. Each of these compounds possesses definite chemical and physical properties by which we can distinguish one compound from another.

A mixture is a substance which consists of two or more elements or compounds not chemically combined together.

Ink, milk, paint and sea-water are common mixtures. All solutions are mixtures. Air is a mixture of oxygen, nitrogen and other gases. Brass is a mixture of copper and zinc.

Differences between a mixture and a compound;

Mixture

Compound

- | | |
|--|--|
| <ol style="list-style-type: none">1. The substances in it can be separated by physical means.2. It usually possesses the common specific properties of its constituents.3. Energy (heat, light or sound) is not usually given out or absorbed when a mixture is made.4. Its composition is <i>variable</i>; the substances can be present in any proportions by weight. | <p>The elements in it cannot be separated by physical means.</p> <p>Its properties are quite different from those of the elements in it.</p> <p>Energy is usually given out or absorbed when a compound is made.</p> <p>Its composition is not <i>variable</i>; the elements are combined in definite proportions by weight.</p> |
|--|--|

definite
infinite

The word SPEC (for Separated, Properties, Energy and Composition) may help you to remember these differences.

Words and Expressions

element ['eliment] *n.* 元素, 单质

compound ['kɒmpaund] *n.* 化合物

mixture ['mɪkstʃə] *n.* 混合物

artificial [a'tɪ'fiʃəl] *a.* 人造的 -ly *ad.* 人造地

- nitrogen [ˈnaɪtrɪdʒən] *n.* 氮
- copper [ˈkɒpə] *n.* 铜
- rare [rɛə] *a.* 稀有的
- percentage [pəˈsentɪdʒ] *n.* 百分率, 百分数
- calcium [ˈkælsiəm] *n.* 钙
- silicon, silicium [ˈsɪlɪkən] [ˈsɪˈlɪʃiəm] *n.* 硅
- sodium [ˈsəʊdɪəm] *n.* 钠
- aluminium [ˌæljuˈmɪnjəm] *n.* 铝
- potassium [pəˈtæʃjəm] *n.* 钾
- magnesium [mægˈniːzjəm] *n.* 镁
- make up 组成; 构成
- lead [led] *n.* 铅
- zinc [zɪŋk] *n.* 锌
- oxide [ˈɒksaɪd] *n.* 氧化物
- carbonate [ˈkɑːbənaɪt] *n.* 碳酸盐
- ulphate [ˈsʌlfeɪt] *n.* 硫酸盐
- silicon dioxide 二氧化硅
- silicate [ˈsɪlɪkaɪt] *n.* 硅酸盐
- rock [rɒk] *n.* 岩(石)
- granite [ˈgrænaɪt] *n.* 花岗岩, 花岗石
- clay [kleɪ] *n.* 泥土, 粘土
- hydrate [ˈhaɪdreɪt] *v.* (使)水合
- combine [kəmˈbaɪn] *v.* (使)结合; 化合
- chlorine [ˈklɒːrɪːn] *n.* 氯化, 氯气
- alcohol [ˈælkəhɒl] *n.* 酒精, 乙醇
- in nature 事实上; 性质上; 实际上
- a great many 很多(的); 大量的
- o property [ˈprɒpəti] *n.* 特性, 性质
- distinguish [dɪsˈtɪŋɡwɪʃ] *v.* 区别, 识别

- paint [peɪnt] *n.* 颜料, 涂料
- o brass [brɑ:s] *n.* 黄铜
- separate ['sepəreɪt] *v.* 使分离
- o constituent [kən'stɪtjuənt] *n.* 成分
- absorb [əb'sɔ:b] *v.* 吸收
- o composition [kəm'pəzɪʃən] *n.* 组成
- variable ['væəriəbl] *a.* 可变的
- proportion [prə'pɔ:ʃən] *n.* 比例

Notes

1. ...consists of one or more of about 90 elements; (由大约九十种元素中的一种或几种组成,)
2. ...and neither are carbon and nitrogen, = and carbon and nitrogen are not in the above list, either. (……碳和氮也未列入上表。) neither 放在句首时用倒装语序, 并省去了跟上句重复的部分 “in the above list”。例如:

I am not a teacher, and neither is my brother.

3. ...by which we can distinguish one compound from another. (……我们可以根据这些(化学和物理)性质将一种化合物跟其他的化合物区别开来。)这是一个定语从句, which 的先行词是 properties. distinguish...from...把……和……区别开来。

1. 元素、化合物和混和物

物质分成两类: 单质*和化合物。单质是不能通过化学变化加以分解的纯净物质。

地球上天然存在的各种物质, 由大约九十种元素中的一种或几种组成。另外十七种元素近几年来曾经先后用人工方法制得。常见的元素有氧、氮、碳、铁、铜及其它金属。许多元素是稀有的, 我们在日

*按西方习惯, 元素和单质几乎没有区分, 因此要根据上下文来理解 element 是指元素还是指单质。此处是指单质。

常生活中从未见过。

地壳是指地球表面几英里厚的薄层。存在于地壳及地壳上水域内的常见元素的百分含量为：

氧	50%	钙	3%
硅	26%	钠	2.5%
铝	7%	钾	2.5%
铁	4%	镁	2%

这八种元素约占地壳的97%，其他八十四种元素仅占地壳的3%。铜、铅和锌没有列入上表，生物所必不可少的碳和氮也未列入。氧在大气中游离存在，并存在于水、氧化物、碳酸盐和硫酸盐中。硅存在于砂(二氧化硅 SiO_2)中和以硅酸盐形式存在于许多岩石如花岗岩中。泥土是一种水含硅酸铝。

化合物是由两种或两种以上的元素化合而成的物质。

水是由氢和氧两种元素组成的化合物；食盐是由钠元素和氯元素组成的化合物；糖和酒精是由氢、氧和碳三种元素组成的化合物。人们已知的化合物大约有200万种。

现在，虽然人们已知的元素仅有107种，但实际上化合物却有许许多多。每种化合物都有一定的化学性质和物理性质，我们可以根据这些性质将一种化合物跟其他的化合物区别开来。

混和物是由两种或两种以上单质或化合物简单混和在在一起的物质。

墨水、牛奶、涂料和海水等都是常见的混和物。所有的溶液都是混和物。空气是由氧气、氮气和其他气体组成的混和物。黄铜是铜和锌的混和物。

混和物与化合物的区别

混和物

1. 混和物中的物质能用物理方法分离。

化合物

- 化合物中的元素不能用物理方法分离。

2. 通常混和物有其组成成分的一般特性。其性质与组成化合物的各元素性质完全不同。
3. 制备混和物时，通常既不放出能量也不吸收能量（热、光、声音）。制取化合物时，通常要放出或吸收能量。
4. 没有固定的组成，各种物质都能以任何质量比混和。有固定的组成，元素是按照一定的质量比化合的。

SPEC这个词是Separated(分离)、Properties(性质)、Energy(能量)、Composition(组成)四个词的缩写，它可以帮助大家记住混和物和化合物的差别。

2. Valency

化合价.

The term ^{专有名词} combining number or valency is a measure of the power of an element or radical ^{原子团} to combine with other elements or radicals. Hydrogen is taken as the standard for combining powers, and its valency is ^{作为标准} 1.

The valency of an element (or radical) is the number of hydrogen atoms which will combine with or displace one atom of the element (or one group of the radical). ^{该原子}

The valency of chlorine is 1 because 1 atom of hydrogen combines with ^{Cl} 1 atom of chlorine to form hydrogen chloride, HCl. The valency of oxygen is 2 because 2 atoms of hydrogen combine with 1 atom of oxygen to form water, H₂O. The valency of zinc is 2 because 1 atom of zinc displaces 2 atoms of hydrogen from dilute acids.

^{从稀酸} Variable valencies. Some elements have different combining powers under different conditions, i.e. their valencies are not constant. The valency of copper can be 1 or 2, and ^{固定不变的} the valency of iron can be 2 or 3 as in these compounds,

Ferrous chloride FeCl₂ Ferric chloride FeCl₃