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АНГЛИЙСКАЯ ГРАММАТИКА

Учебное пособие
для аспирантов химико-технологического профиля

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Учебное пособие, ориентированное на обучение аспирантов химико-технологического профиля, представляет в кратком, максимально доступном и систематизированном виде теоретические сведения по наиболее важным разделам грамматики английского языка. Большая часть грамматического материала представлена в виде разнообразных схем и таблиц. Комплекс практических упражнений позволяет выработать устойчивые навыки перевода, необходимые для правильной передачи содержания англоязычной оригинальной научно-технической литературы. Большой выбор тренировочных упражнений позволяет использовать пособие как для аудиторной, так и самостоятельной работы аспирантов химико-технологического профиля.

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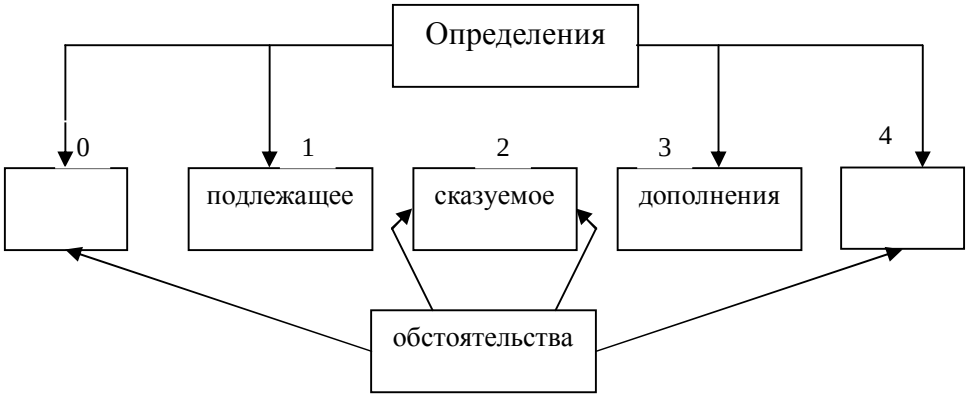
Тема 1

СТРУКТУРА ПРОСТОГО ПОВЕСТВОВАТЕЛЬНОГО АНГЛИЙСКОГО ПРЕДЛОЖЕНИЯ



e.g. Students translate texts.

e.g. This year the students of this group often translate English texts.

e.g. This year the students of all the groups of our University very often translate special texts from the American and English scientific journals.

Ex. 1. Составьте предложения из следующих слов.

1. I, day, to, every, university, go. 2. Work, in the lab, very, they, well. 3. Very, book, much, this, like, we. 4. Book, this, my, is. 5. A new, he, car, drives. 6. Go, I, alone, home. 7. To, we, summer, go, usually, seaside, every, the. 8. Term, many, we, subjects, last, interesting, studied. 9. For, left, our, yesterday, friends, London. 10. The, in, nobody, there, now, classroom, is.

Ex. 2. Поставьте слова и выражения в нужном порядке.

1. a newspaper / reads / every day / Jill. 2. chemistry / like / very much / I. 3. lost / I / my watch / last week. 4. Tom / the letter / slowly / read. 5. we / at the conference / some friends / met. 6. a lot of housework / did / I / yesterday. 7. my plan / carefully / I / explained. 8. I / very well / English / don't speak. 9. I / want to speak / fluently / English. 10. passed / Ann / easily / the examination. 11. every day / do / the same thing / we. 12. I / this picture / don't like / very much.

Тема 2

БЛОК СКАЗУЕМОГО: ГЛАГОЛЫ

to be

(***быть, являться, находиться***)

Спряжение глагола *to be*

	Present (настоящее)	Past (прошедшее)	Future (будущее)
I he, she, it	***am*** ***is***	***was***	***will be***
We, you, they	***are***	***were***	***will be***

Функции глагола ***to be*** в предложении	1. **Смысловой глагол** (***БЫТЬ, ЯВЛЯТЬСЯ, НАХОДИТЬСЯ***) В настоящем времени глагол ***to be*** часто не переводится ***e.g.*** Our University ***is*** in the centre of the town. (*Наш университет находится в центре города*.) I **was** in the lab yesterday.
	2. **Вспомогательный глагол** (для образования времен группы *Continuous* и *Passive Voice – см. табл.*) – **НЕ ПЕРЕВОДИТСЯ**! ***e.g.*** He ***is*** studying at the University now. (*Сейчас он учится в университете*.)
	3. **Модальный глагол** (значение ***долженствования***, *be + Infinitive*) – ***ДОЛЖЕН, ОБЯЗАН*** ***e.g.*** He ***is*** to carry out an experiment. (*Он **должен** сделать эксперимент*.)
	4. **Глагол-связка** (be + существительное) – **НЕ ПЕРЕВОДИТСЯ** ***e.g.*** I ***am*** a post-graduate student. (*Я аспирант*.)
	5. **Глагол-связка** (be + инфинитив) после слов task, aim, object, purpose, plan, idea, function, intention *[… состоит в том, чтобы …]* ***e.g.*** Our aim is to carry out an experiment. (*Наша цель состоит в том, чтобы провести эксперимент*.)

ОБОРОТ "there + be"
(есть, иметься, находиться)

Структура предложения: Оборот + подлежащее + обстоятельство места/ времени

!!!!! Перевод предложения на русский язык начинается **с конца предложения, с обстоятельства**.

ОБОРОТ "**there + be**"	Настоящее время ***there is*** (имеется) ***there are*** (имеются)	***There is*** a computer in the room. (*В комнате* ***есть*** *компьютер*.) ***There are*** students in the class. (*В классе* ***находятся*** *студенты*.)
	Прошедшее время ***there was*** (имелось) ***there were*** (имелись)	***There was*** a park in the town. (*В городе* ***был*** *парк*.) ***There were*** trees in the street. (*На улице* ***были*** *деревья*.)
	Будущее время ***there will be*** (будет иметься)	***There will be*** a new school in the town. (*В городе* ***будет*** *новая школа*.)

to have
(***есть, иметь, иметься***)

Спряжение глагола *to have*

	Present	Past	Future
I he, she, it	***have*** ***has***	***had***	***will have***
We, you, they	***have***	***had***	***will have***

Функции глагола ***to have*** в предложении	1. **Смысловой глагол** (***ЕСТЬ, ИМЕТЬ, ИМЕТЬСЯ; У … ЕСТЬ …***) ***e.g.*** She ***has*** a new text book. (*У нее (есть) новый учебник*.)
	2. **Вспомогательный глагол** (для образования времен группы *Perfect*) – **НЕ ПЕРЕВОДИТСЯ** ***e.g.*** I ***had*** translated the text before you came. (*Я перевел текст до того, как ты пришел*.)
	3. **Модальный глагол** (значение ***вынужденности***, *be + Infinitive*) ***e.g.*** I ***have*** to do my homework every day. (*Я* ***вынужден***

	выполнять домашнее задание каждый день.)
	4. **Часть фразового сказуемого (НЕ ПЕРЕВОДИТСЯ)** to have a look – посмотреть, изучить to have a discussion – обсуждать to have a rest – отдыхать

Ex. 3. Заполните пропуски личными формами глагола to be. Переведите.
1) am; 2) is; 3) are; 4) was; 5) were; 6) will be

1. He ... born in 1980. 2. Her name ... Mary. 3. At the university we ... good friends. 4. I ... a mastership student. 5. What ... you by profession? 6. Soon these students ... engineers. 7. It ... a book. 8. ... you … at work tomorrow? 9. Where ... you yesterday? 10. I... at home tomorrow. 11. ... she right or not? 12. What country ... you from? 13. ... he your best friend? 14. Where ... this city situated? 15. ... you fond of reading? 16. When and where ... you born? 17. It ... never too late to learn. 18. This text ... translated yesterday. 19. Tomorrow at nine o'clock they ... at our office. 20. Mike …a computer operator. 21. I ... on business here. 22. It ... my car. 23. I ... never late for these lectures. 24. In some days we ... back.

Ex. 4. Ответьте на вопросы сначала утвердительно, затем отрицательно.

Model: Is Andrew present at the lesson?
Yes, he is. No, he is not.

1. Is Lezhnevsky Street long? 2. Was last winter cold? 3. Is your University large? 4. Is it hot today? 5. Is it Sunday today? 6. Were your summer plans interesting? 7. Are you at the lesson? 8. Will you be at home in the evening? 9. Are the trees green now? 10. Is your house in the centre of the city? 11. Will your mother be at home at 5 o'clock? 12. Were you free yesterday? 13. Is mathematics difficult? 14. Will you be in town on Sunday?

Ex. 5. Выберите правильную форму глагола. Переведите.

1. Our University (is, are) very large. 2. There (are, is) four thousand students in our Institute. 3. There (are, is) eight departments in it. 4. There (are, is) a lot of classrooms and labs at our University. 5. There (are, is) a large hall on the first floor. 6. On the ground floor there (are, is) a large reading hall. 7. There (are, is) many magazines and newspapers in it. 8. There (are, is) a library on the second floor.

***Ex. 6. Переведите предложения на русский язык, обращая внимание на оборот* there be.**

1. There are 9 elements in Group I. 2. There is only 1 electron in the hydrogen atom. 3. There are many things on the earth which are named after Mendeleyev. 4. There are many institutes in Russia which have got Mendeleyev's name. 5. There are some elements which don't exist in nature, scientists obtained them in laboratory. 6. There are some elements in Group I that are very active. 7. There are

some elements which are not active. 8. There are many features in which elements differ radically. 9. Originally there were fewer elements in the periodic table.

Ex. 7. Заполните пропуски глаголом to have в нужной форме. Переведите.
1) have; 2) has; 3) had; 4) will have

1. Who ... English books at home? 2. Last month they ... a lot of work. 3. What do you usually ... for dinner? 4. Yesterday they... to wait for their bus. 5. Soon I ... a new computer. 6. At present, we ... three lectures a day. 7. Next term they ... five exams. 8. It was very cold and they ... to stay at home. 9. ... you ever been to our city? 10. It was too late and I ... to take a taxi. 11. When ... they ... vacations? 12. In some days you ... to return the book to the library. 13. I ... to re-write this test next lesson. 14. ... you ... any seminars next week? 15. Our family ... a comfortable flat in the center of the city.

Ex. 8. Скажите предложения в прошедшем и будущем времени, добавив соответствующие обстоятельства времени (*yesterday, last week / month / year, 5 days / a week / a month ago, in 1998; tomorrow, next week / month / year, in a week, in 3 days, in 2011*).

MODEL: He has a car.
*He **had** a car last year.*
*He **will have** a car in 2 years.*

1. They have a big house in the country. 2. My friend has many interesting books. 3. His mother has a nice garden. 4. She has a good unit. 5. We have a big lab. 6. I have a beautiful picture. 7. These students have five examinations. 8. His parents have a comfortable flat. 9. John has a good job. 10. These students have four classes every day.

***Ex. 9. Переведите предложения на русский язык, обращая внимание на глагол* have.**

1. Chemists have already identified over a million compounds. 2. We have designed an appliance which provides the cooling of our instruments. 3. We have to test our installations every five years. 4. Metals are seldom used in their pure form as alloys have better properties for industrial application. 5. Aluminuim is light in weight, has high corrosion-resistant qualities. 6. As the experiment is very difficult, he has to spend much time in the laboratory. 7. The 20^{th} century has become the century of many inventions. 8. The term "gravitation" is used for denoting the force of attraction which every particle of matter in the universe has for every other particle. 9. Technology has made modern society possible. 10. Technology has raised the standard of living.

ВИДО-ВРЕМЕННЫЕ ФОРМЫ АНГЛИЙСКОГО ГЛАГОЛА

ACTIVE VOICE (действительный залог)

	SIMPLE	PROGRESSIVE	PERFECT	PERFECT PROGRESSIVE
	Констатация факта	**Процесс**	**Завершенность**	**Процесс в течение некоторого периода времени**
PRESENT *НАСТОЯЩЕЕ*	**V, V-s** ***ДЕЛАЕТ*** He **translates** Он *переводит*	**am / is / are + V-ing** ***ДЕЛАЕТ*** He **is translating** Он *переводит*	**have / has + V-ed, V_3** ***СДЕЛАЛ*** He **has translated** Он *перевёл*	**have / has + been V-ing** ***ДЕЛАЕТ*** He **has been translating** Он *переводит*
PAST *ПРОШЕДШЕЕ*	**V-ed, V_2** ***ДЕЛАЛ*** He **translated** Он *переводил*	**was / were + V-ing** ***ДЕЛАЛ*** He **was translating** Он *переводил*	**had V-ed, V_3** ***СДЕЛАЛ*** He **had translated** Он *перевёл*	**had been V-ing** ***ДЕЛАЛ*** He **had been translating** Он *переводил*
FUTURE *БУДУЩЕЕ*	**will V** ***БУДЕТ ДЕЛАТЬ*** He **will translate** Он *будет переводить*	**will be V-ing** ***БУДЕТ ДЕЛАТЬ*** He **will be translating** Он *будет переводить*	**will have V-ed, V_3** ***СДЕЛАЕТ*** He **will have translated** Он *переведёт*	**will have been V-ing** ***БУДЕТ ДЕЛАТЬ*** He **will have been translating** Он *будет переводит*

PASSIVE VOICE (страдательный залог)

	SIMPLE	PROGRESSIVE	PERFECT	PERFECT PROGRESSIVE
	Констатация факта	**Процесс**	**Завершенность**	**Процесс в течение некоторого периода времени**
PRESENT *НАСТОЯЩЕЕ*	**am / is / are + V-ed, V_3** ***ДЕЛАЕТСЯ / ДЕЛАЮТ*** The text **is translated** Текст *переводится*	**am / is / are + being V-ed, V_3** ***ДЕЛАЕТСЯ / ДЕЛАЮТ*** The text **is being translated** Текст *переводится*	**have / has + been V-ed, V_3** ***БЫЛО СДЕЛАНО / СДЕЛАЛИ*** The text **has been translated** Текст *был переведён*	Вместо отсутствующих форм ***PERFECT PROGRESSIVE*** употребляются формы ***PERFECT***
PAST *ПРОШЕДШЕЕ*	**was / were + V-ed, V_3** ***ДЕЛАЛОСЬ / ДЕЛАЛИ*** The text **was translated** Текст *переводился*	**was / were + being V-ed, V_3** ***ДЕЛАЛОСЬ / ДЕЛАЛИ*** The text **was being translated** Текст *переводился*	**had been V-ed, V_3** ***БЫЛО СДЕЛАНО/ СДЕЛАЛИ*** The text **had been translated** Текст *был переведён*	
FUTURE *БУДУЩЕЕ*	**will be V-ed, V_3** ***БУДЕТ ДЕЛАТЬСЯ / БУДУТ ДЕЛАТЬ*** The text **will be translated** Текст *будет переводиться*	Вместо отсутствующей формы употребляется ***FUTURE SIMPLE***	**will have been V-ed, V_3** ***БУДЕТ СДЕЛАНО / СДЕЛАЮТ*** The text **will have been translated** Текст уже *будет переведён*	

Ex. 10. Переведите на русский язык, пользуясь таблицей видо-временных форм глагола.

to investigate *– исследовать*

investigated, investigates, had investigated, will investigate, is investigating, has investigated;

to measure *– измерять*

measure, will measure, have measured, are measuring, measured, had measured;

to contain *– содержать*

contains, will contain, contained

to melt *– плавить, растапливать*

melts, has melted, will melt, are melting, melted,

to develop *– развивать, разрабатывать*

will develop, develop, has developed, developed, are developing,

to remove *– удалять*

removed, will remove, remove, have removed,

to discuss *– обсуждать*

will discuss, discuss, discussed, are discussing, has discussed,

to discover *– открывать, обнаруживать*

discovers, discovered, will discover, had discovered, has discovered

to know *– знать*

knew, knows, has known, will know

to use *– использовать*

is using, use, were using, used, have used, will use,

to apply *– применять*

will apply, applies, applied, is applying, has applied

to collide *– сталкиваться*

collided, collide, will collide, have collided

to transform *– превращать*

transform, transformed, will transform, is transforming, has transformed

to change *– изменять*

will change, changes, changed, has changed

Ex. 11. Найдите и подчеркните сказуемые в ДЕЙСТВИТЕЛЬНОМ ЗАЛОГЕ. Переведите предложения на русский язык.

A) 1. The element has some important properties. 2. Mathematics is an important subject for technical students. 3.We will begin a new experiment after you show us the results of your last experiment. 4. He works much at his invention. 5. Last week we worked 10 hours a day. 6. Now he has an interval in his work. 7. In some days he will continue his work. 8. This generator produces a great amount of electric energy. 9. The scientist presented some methods of solution of this important problem. 10. When Einstein was 12, he began his study of mathematics

and physics. 11. The engineers of the research laboratory developed some new methods of work. 12. They were studying Physics when I joined them. 13. This diagram will help to solve your problem. 14. Our plant is producing some new chemical apparatus. 15. The water in the tube is boiling. 16. The laboratory assistant was writing down all the data during our experiment yesterday. 17. Russian scientists and engineers are developing a lot of new types of electronic devices. 18. Russian chemical science is solving many complex problems and its rapid development will be raising the standard of life of people. 19. Chemistry is the science that deals with the structure of matter and its changes. 20. By the end of the 19^{th} century scientists had made the first attempts to obtain synthetic materials. 21. The workers will have built this new house by the beginning of the new year. 22. Our country has made great achievements in all fields of industry, technology and science. 23. After graduation from the institute he will work at the plant as an engineer. 24. They haven't received any good results. 25. Metallurgical industry needs many trained specialists. 26. Radio engineering, electronics and television have already found great application in industry, transport and medicine. 27. The discovery of radio waves by Alexander Popov in 1895 had a great value for mankind. 28. My friend had been to London before he came to Moscow. 29. The workers were building that house when we came to Moscow. 30. They have already have finished their work.

B) 1. Since its discovery the periodic system of the chemical elements has long served and is still serving as the greatest contribution to the study of nature. 2. This century has seen great changes in science and the life of people. 3. The ideas of many outstanding researchers originate from the periodic law. 4. It is a remarkable fact that Mendeleyev actually spent only a few years in developing the periodic table, and then went on to other work. 5. The structure of the periodic system has expanded to a considerable degree. 6. A person of wide interests, Mendeleyev successfully dealt with problems in mathematics, astronomy, meteorology, philosophy, economics and art. 7. He placed work as an explorer of nature at the first place. 8. Mendeleyev tried to do his best for the economic and industrial progress of Russia. 9. Works of outstanding chemists help to intensify the development of science, technology and industry. 10. The laboratory led by Academician George Flyorov has been the cradle of many transuraniums. 11. Mendeleyev published his periodic system in 1869. 12. Mendeleyev's law helped the American Glenn Seaborg who led a group of researchers to obtain a number of elements, including mendelevium, in laboratory conditions.

СТРАДАТЕЛЬНЫЙ ЗАЛОГ (P A S S I V E V O I C E)

Если подлежащее обозначает лицо или предмет, подвергающийся действию со стороны другого лица или предмета, то глагол употребляется в форме **СТРАДАТЕЛЬНОГО ЗАЛОГА**.

ОБРАЗОВАНИЕ

to be в соответствующем времени + **V-ed, V_3**

Изменяется только глагол ***to be***, смысловой же глагол имеет во всех временах одну и ту же форму. Следовательно время, в котором стоит глагол в страдательном залоге, определяется формой, в которой стоит вспомогательный глагол ***to be***.

СПОСОБЫ ПЕРЕВОДА

1. при помощи глагола ***быть*** и краткой формы причастия страдательного залога (глагол ***быть*** в настоящем времени не употребляется): ***e.g.*** **дом построен / дом был построен / дом будет построен**;
2. глаголом, оканчивающимся на ***-ся***: ***e.g.*** **дом строит*ся* / дом строил*ся* / дом будет строить*ся***;
3. неопределенно-личным оборотом с глаголом в действительном залоге в 3-м лице множественного числа: ***e.g.*** **дом строят / дом строили / дом будут строить**.

ОСОБЕННОСТИ ПЕРЕВОДА

1) Если в английском предложении после сказуемого в страдательном залоге стоит предлог, относящийся к нему (а не к следующему за ним слову), при переводе на русский язык предлог ставится перед тем словом, которое в английском языке является подлежащим. (***e.g.*** This experiment was much spoken ***about***. – **Об** *этом эксперименте много говорили*.)
   1. **to account for** – объяснять что-л.
   2. **to agree upon** – договориться о чем-л.
   3. **to arrive at** – достигать чего-л.
   4. **to comment upon** – комментировать что-л.
   5. **to depend on** – полагаться на кого-л. / что-л.; зависеть от
   6. **to dispose of** – реализовать, ликвидировать что-л.
   7. **to insist on (upon)** – настаивать на чем-л.
   8. **to interfere with** – мешать кому-л.
   9. **to listen to** – слушать кого-л.
   10. **to look at** – смотреть на кого-л. / что-л.
   11. **to provide for** – предусматривать что-л.
   12. **to refer to** – ссылаться на кого-л. / что-л.
   13. **to rely on** – полагаться на кого-л. / что-л.
   14. **to speak of (about)** – говорить о ком-л. / чем-л.
   15. **to take care of** – заботиться о ком-л. / чем-л.

2) В английском языке имеется ряд глаголов, которые требуют прямого дополнения, в то время как соответствующие глаголы в русском языке

требуют прямого дополнения. В таких случаях при переводе на русский язык, соответствующий предлог ставится перед словом, которое в английском предложении является подлежащим. (***e.g.*** The lecture was attended by many students. – **На** *лекции присутствовало много студентов*.)

1. **to affect smb. / smth.** – влиять на кого-л. / что-л.
2. **to answer smth.** – отвечать на что-л.
3. **to attend smth.** – присутствовать на чем-л.
4. **to enjoy smth.** – получать удовольствие от чего-л.
5. **to follow smb. / smth.** – следовать за кем-л. / чем-л.
6. **to join smb.** – присоединяться к кому-л.
7. **to need smb. / smth.** – нуждаться в ком-л. / чем-л.
8. **to watch smb. / smth.** – следить за кем-л. / чем-л.

Страдательный оборот с формальным подлежащим *it*

Переводится неопределенно-личным предложением

1. It is said – ***говорят***
2. It is reported – ***сообщают***
3. It is known – ***известно***
4. It is believed – ***полагают***
5. It is expected – ***ожидают***

e.g. ***It is reported*** that the delegation has left Moscow. – ***Сообщают***, что делегация выехала из Москвы.

It was expected that he would return soon. – ***Ожидали***, что он скоро вернется.

Ex. 12. Переведите сказуемые на русский язык, пользуясь таблицей видо-временных форм глагола.

to make – *делать*

was made, is made, will be made, have been made, will have been made

to melt – *плавить, растапливать*

will be melted, is melted, were melted, is being melted, has been melted

to call – *называть*

is called, has been called, was called, will be called

to delay – *откладывать*

are delayed, will be delayed, was delayed,

to take – *взять, брать*

are taken, will be taken, have been taken, were taken,

to obtain – *получать, приобретать*

will be obtained, is obtained, has been obtained, was obtained

to discover – *открывать, обнаруживать*

were discovered, are discovered, will be discovered, have been discovered,

to perform – *выполнять*

are performed, will be performed, were performed, are being performed, has been performed,

to accept – *принимать*

have been accepted, will be accepted, was accepted, is accepted,

to publish *– публиковать, издавать*
was published, has been published, are published, will be published

to study *– изучать*
are studied, will be studied, has been studied, were studied

to apply *– применять*
was applied, is applied, has been applied, will be applied

to use *– использовать*
will be used, is used, was used, have been used

to produce *– производить, вырабатывать*
are produced, was produced, will be produced, have been produced,

to write *– писать*
was written, will be written, has been written, is written

Ex. 13. Найдите и подчеркните сказуемые в СТРАДАТЕЛЬНОМ ЗАЛОГЕ. Переведите предложения на русский язык.

1. Special attention was drawn to valence. 2. The most important step was taken when Mendeleyev studied the relation between the atomic weights and the properties of the elements. 3. This final step was taken by the great Russian chemist in 1869. 4. A periodic table containing seventeen columns was proposed by him. 5. Radon was discovered during the investigation of the properties of radium and radioactive substances. 6. The periodic law was accepted and widely used by chemists. 7. It was found that the atomic weights which had been accepted for some elements were not accurate. 8. After the paper on the periodic table was presented, it was soon published in Russian and in German. 9. Properties of chemical elements and compounds are thoroughly studied in laboratories. 10. Some elements were given new places in the table after the revision of their atomic weights. 11. The periodic law is widely applied by chemists.

ACTIVE AND PASSIVE VOICE

Ex. 14. Переведите на русский язык, пользуясь таблицей видо-временных форм глагола.

to investigate *– исследовать*
The scientist investigated.
The substance was investigated.
The researchers will investigate.
The substance will be investigated.
The scientist was investigating.
The substance has been investigated.
My supervisor has investigated.

to use *– использовать*
They use.
The device was used.
They are using this device.
They have used this device.
This device had been used.
They will use this device.
This device will be used.

to develop *– развивать, разрабатывать*
The chemists will develop this theory.
This theory was developed.

to publish *– публиковать, издавать*
They will publish the article.
The article was published.
The article has been published.

The chemists have developed this theory.
This theory had been developed.
The chemists are developing this theory.
This theory will be developed.
The chemists developed this theory.
This theory was being developed.

to discuss – *обсуждать*

The researchers will discuss.
The problem has been discussed.
This problem will be discussed.
The researchers discussed the problem.
The problem was discussed.
The researchers are discussing the problem.
The researchers has discussed the problem.

to apply – *применять*

The method is applied.
The scientists will apply this method.
The method has been applied.
The scientists applied this method.
The method was applied.
The scientists has applied this method.
The method was being applied.
The scientists will be applying this method.

They publish the article.
The article will be published.
They were publishing the article.
The article will have been published.
They have published the article.

to produce – *производить, вырабатывать*

The substance was produced.
The chemists are producing the substance.
The substance will be produced.
The chemists have produced the substance.
The substance had been produced.
The chemists will produce the substance.
The substance has been produced.

to obtain – *получать*

The results were obtained.
The scientists obtained the results.
The results will be obtained.
The scientists are obtaining the results.
The results have been obtained.
The scientists will obtain the results.
The results are obtained.
The scientists had obtained the results.

Ex. 15. Переведите предложения на русский язык, обращая внимание на сказуемые в страдательном залоге. Подчеркните сказуемые.

A) 1. Oxygen was obtained by Scheele and Priestley independently. 2. Oxygen was obtained by heating mercuric oxide. 3. Evidence was found that this gas is a component of the atmosphere. 4. Attempts were made to obtain pure oxygen. 5. An important role of oxygen in combustion was discovered by Priestley. 6. Much attention has been given recently to the study of this group of oxides. 7. The modern concept of combustion was established by Lavoisier. 8. Substances such as phosphorus and sulphur are known as non-metals. 9. Attention was drawn to the valence of substances. 10. Oxygen is found in the free state in the atmosphere. 10. 11. When a substance is attacked by oxygen, it forms an oxide or a number of oxides. 12. Oxygen is constantly being put back to the atmosphere by trees and other plants. 13. This method has been followed since the time of Priestley.

B) 1. The rate of this reaction can be strongly influenced by high temperature. 2. The changes in these parameters during decomposition were followed by a number of other changes. 3. Common salt was acted upon by sulphuric acid and hydrogen chloride was produced. 4. His work in this field can be relied on. 5. They were told about the new discoveries in oil production. 6.The change in colour was followed by the change of other properties. 7. Fermi is looked upon as an outstanding physicist of our time. 8. The results of their investigation can be referred to. 9. I was asked to attend his lecture on chemistry. 10. Liquid solutions will be dealt with in this chapter. 11. The qualitative examination of this compound is followed by the quantitative one. 12. This theory is not much spoken about at present. 13. The elements helium, neon, argon, krypton and xenon are referred to as noble gases. 14. Gold is unaffected by oxygen. 15. Many kinds of oxides are met with in the study of chemistry. 16. Potassium is quickly acted on by the oxygen of the air. 17. The lecture was followed by the demonstration of experiments. 18. The first success was followed by many others. 19. The yield of the reaction is greatly affected by temperature.

МОДАЛЬНЫЕ ГЛАГОЛЫ И ИХ ЭКВИВАЛЕНТЫ
can, may, must, ought to, should, need

	Возможность		Разрешение		Долженствование	
	мод.гл.	**эквивалент**	**мод.гл.**	**эквивалент**	**мод.гл.**	**эквиваленты**
	Can (*мочь, уметь*)	**to be able (to) *(смочь)***	**May (*мочь, можно*)**	**to be allowed (to) *(разрешать; давать)***	**Must *(должен)* Should, ought to *(следует)***	**to have (to) *(вынужден, придется)*** **to be (to) *(должен, нужно)***
Present	**I can** Я могу	**I am able (to)** Я могу (в состоянии), умею	**I may** Я могу (Мне разрешается)	**I am allowed (to)** Мне позволяют	**I must** Я должен **I should/ ought to** Мне следует	**I have (to)** Я должен (мне приходится, я вынужден) **I am (to)** Я должен (мне предстоит)
Past	**I could** Я мог	**I was able (to)** Я мог (был в состоянии)	**I might** Я мог бы	**I was allowed (to)** Мне позволили	___	**I had (to)** Я должен был (мне пришлось, я был вынужден) **I was (to)** Я должен был (мне предстояло)
Future	___	**I will be able (to)** Я смогу	___	**I will be allowed (to)** Мне позволят	___	**I will have (to)** Я должен буду (мне придется)

CAN (*выражает физическую или умственную возможность или способность*)
He can lift that box. (Он может поднять эту коробку.)
He can drive the car well. (Он умеет хорошо водить машину.)

MAY (*выражает разрешение или возможность совершения действия или просьбу*)
You may use dictionaries. (Вы можете пользоваться словарями.)
May I take your books? (Можно я возьму ваши книги?)

MUST (*выражает долженствование, т.е. необходимость совершения действия*)
Water must be decomposed to obtain oxygen. (Воду нужно разложить (на составные части), чтобы получить кислород.)

SHOULD, OUGHT TO (*выражают долженствование, когда речь идет о моральном долге или совете*)
He ought to help his friends. (Ему следует помогать друзьям.)
This solution should be kept in a dark place. (Этот раствор следует хранить в темном месте.)

ЭКВИВАЛЕНТЫ МОДАЛЬНЫХ ГЛАГОЛОВ

to be able to
We will be able to produce nitric oxide next week. (Мы сможем получить оксид азота на следующей неделе.)

to be allowed to
The students were allowed to carry out the experiments with sulphuric acid. (Студентам разрешили проводить опыты с серной кислотой.)
*В технических текстах выражение to be allowed to переводится словом "**дать**"*: The solution was allowed to stand two days. (Раствору дали отстояться в течение 2-х дней.)

to be to (*выражает необходимость совершения действия согласно предварительной договоренности или заранее намеченному плану*)
We are to do this experiment today. (Мы должны сделать этот опыт сегодня.)

to have to (*выражает вынужденную необходимость совершения действия*)
We had to finish our experiment yesterday. (Нам пришлось закончить эксперимент вчера.)

Ex. 16. Переведите предложения на русский язык, обращая внимание на модальные глаголы.
A) 1. This experiment can be started only tomorrow. 2. Could they investigate this phenomenon earlier? 3. He may take this glassware. 4. May I use your unit for my

experiment? 5. This substance may prevent this reaction. 6. The hydrides can decompose in water, releasing hydrogen. 7. You must finish your experimental work immediately. 8. You mustn't be there. 9. The researchers must know the results of the experiments. 10. This must be a very powerful reagent. 11. Scientists ought to be more attentive. 12. The post graduate students ought to have shown their plans to their supervisors. 13. The scientists should change the conditions of the experiment. 14. You need not stay in the laboratory after the tests are finished. 15. This substance should be acted on by a strong reagent.

B) 1. Such question can not be answered at once. 2. The rate of the reaction is to be influenced by gas temperature. 3. Einstein's theory of relativity has to be referred to by many researchers. 4. Nitric acid may be obtained by the reaction of concentrated sulfuric acid with sodium nitrate. 5. The liquid was to be allowed to evaporate. 6. This insoluble compound should not be affected by acids. 7. It must be noted that this huge automatic unit is operated by only one person. 8. It is to be remembered that concentrated acids are very dangerous. 9. All the devices and glassware are to be kept in good order in the laboratory.

Ex. 17. Переведите предложения на русский язык, обращая внимание на модальные глаголы. Выделите эквиваленты.

1. Selenium may be found in various ores. 2. We are able to describe the properties of any element looking at the periodic table. 3. Selenium can occur in several allotropic forms. 4. Chemists must remember that sulphur is a nonconductor of electricity. 5. Under proper conditions we may obtain a colloid. 6. He must be able to explain the difference between organic salts and inorganic salts. 7. Students have to understand reactions well. 8. Matter and its transformations must be studied by specialists. 9. Working in our laboratory, we can change the state of substances. 10. The experiment is to be started at once. 11. You needn't heat the substances, the reaction proceeds fast enough. 12. You should know the properties of the substances if you have to work with them. 13. Sometimes we needn't accelerate the reaction. 14. Mendeleyev was able to predict in advance the existence and properties of yet undiscovered elements. 15. Mendeleyev couldn't be present at the meeting of Russian chemical society and had to ask Menshutkin to read the paper for him. 16. Students will be able to identify substances after some practice in qualitative analysis. 17. We should clean the glassware before working with it. 18. Lavoisier was able to establish his theory of combustion on the basis of the experimental results of Priestley, Sheele and others. 19. He said that we might have applied the wrong catalyst. 20. You should remember that the yield in this reaction is good only if it goes to completion.

Тема 3
Блок подлежащего

Подлежащее занимает левое место от сказуемого. Однако не любое слово в начале предложения является подлежащим. Чтобы опознать подлежащее, надо знать, чем оно может быть выражено в предложении.

Способы выражения подлежащего

I. Именем существительным без предлога (слева от сказуемого)
e.g. Investigations were very important. (*Исследования были очень важны*.)

1) Подлежащее может иметь при себе ***левые определения***, которые входят в группу подлежащего. Левое определение может быть выражено *прилагательным*, *причастием*, *существительным*
e.g. The main results were connected with the investigations. (*Основные результаты были связаны с исследованиями*.)
e.g. The investigated problem was very important. (*Исследованная проблема была очень важна*.)

Существительное в роли определения **(цепочка существительных)**

сущ. + сущ. + … + сущ
опред. опред. основное

В цепочке существительных **ПОСЛЕДНЕЕ – ГЛАВНОЕ**, все предыдущие являются определением к нему.

сущ. + сущ. переводится
- прилагательным (***e.g.*** iron bridge – *железный мост*)
- существительным в родительном падеже (***e.g.*** daylight lamp – *лампа дневного света*)
- существительным с предлогом (***e.g.*** synthetic rubber products – *изделия из синтетического каучука*)

e.g. Low temperature heat treatment – *тепловая обработка при низких температурах*

2) Подлежащее может иметь ***правое определение*** (причастие, инфинитив, инфинитивный оборот)
e.g. The equipment used in our laboratory operates well. (*Оборудование, используемое в нашей лаборатории, хорошо работает*.)
e.g. The equipment to be used in our laboratory has been tested. (*Оборудование, которое будет использоваться в нашей лаборатории, было протестировано*.)

3) Подлежащее может иметь и ***правое*** и ***левое определение***

e.g. The new unit designed according to the scheme discussed above will be tested in our laboratory. (*Новая установка, сконструированная согласно описанной выше схеме, будет проходить испытания в нашей лаборатории*.)

II. Подлежащее может быть выражено **местоимением** (явное подлежащее):

1) ***ЛИЧНЫЕ МЕСТОИМЕНИЯ*** (I, he, she, it, we, you, they и who)

e.g. We have analysed the problem. (*Мы проанализировали эту проблему*.)

e.g. Aluminium is a metal. **It** is light. (*Алюминий – это металл.* ***Он*** *легкий*.)

2) ***НЕОПРЕДЕЛЕННОЕ МЕСТОИМЕНИЕ*** **"ONE" (НЕ ПЕРЕВОДИТСЯ)**

В этом случае "***one***" на русский язык **не переводится**, а сказуемое переводится 2 лицом ед.ч. (*делаешь*), или 3 лицом мн.ч. (*делают*).

e.g. ***One*** often finds great differences in comparing this compounds. (*Часто находишь (находят) большие различия при сравнении этих соединений*.)

e.g. ***One*** never knows what may happen. (*Никогда не знаешь, что может случиться*.)

one + модальный глагол – переводится безличным предложением

one must – *нужно* **one can** – *можно* **one should** – *следует*

one has to – *нужно* **one may** – *можно*

e.g. One should know the difference between these two substances. (*Следует (нужно) знать разницу между этими двумя веществами*.)

КРОМЕ ТОГО

A. Местоимение ***one*** употребляется для замены ранее упомянутого существительного в единственном числе, ***ones*** – во множественном числе. ***One*** или совсем не переводится или переводится ранее упомянутым существительным.

e.g. The attractions between gas molecules are very slight ***ones***. (*Силы притяжения между молекулами газа очень незначительные*.)

This laboratory was opened in our University last year, and ***that one*** 5 years ago. (*Эта лаборатория была открыта в нашем университете в прошлом году, а* ***та (лаборатория)*** *– 5 лет назад*.)

B. Сочетание "***the one***", употребляемое для замены ранее упомянутого существительного, переводится "***тот который***".

e.g. An elementary substance is ***the one*** which consists of only one kind of atoms. (*Элементарным веществом является* ***то, которое*** *состоит только из одного вида атомов.*)

C. One в форме притяжательного падежа ***one's*** может быть определением и переводится "***свой***"

e.g. One should write down the results of ***one's*** experiments. (*Следует записывать результаты* ***своих*** *экспериментов*.)

3) ***МЕСТОИМЕНИЕ it*** – формальное подлежащее безличного предложения. (**НЕ ПЕРЕВОДИТСЯ**)

3.1. При обозначении явлений природы, времени, расстояния.

e.g. **It** is cold. (*Холодно*.)

It is 12 o'clock. (*12 часов*.)

3.2. С глаголами **to seem** (*казаться*), **to chance** (*случаться*), **to happen** (*случаться*), **to turn out** (*оказываться*), **to appear** (*казаться*) ***it*** переводится неопределенно личным оборотом типа "***кажется, случается***".

e.g. **It** seems that iron is one of the most important metals. (***Кажется***, *железо – один из самых важных металлов*.)

3.3. При логическом подлежащем, которое выражено инфинитивом, герундием или придаточным предложением.

e.g. In chemistry **it** is common ***to consider*** the properties of the materials. (Логическое подлежащее – инфинитив - ***to consider***) (*В химии обычно рассматривают свойства веществ*.

3.4. При сказуемом в страдательном залоге, выраженном глаголами **to see** (*видеть*), **to know** (*знать*), **to consider** (*считать*), **to say** (*говорить*), **to think** (*думать*) ***it*** переводится неопределенно-личным оборотом типа "**известно, думают, считают**"

e.g. **It** is known that modern industry needs many metals. (**Известно**, *что современной промышленности необходимы многие металлы*.

3.5. Усилительное **it** (для смыслового выделения) в конструкциях:

3.5.1. **It is (was) … that (who, which) …** . Выделяемый член предложения ставится обычно между глаголом-связкой (*is, was*) и союзом (*that, who*). При переводе перед выделяемым членом предложения необходимо поставить слово "***ИМЕННО***", а союз (*that, who*) и ***it*** на русский **не переводить**.

e.g. **It was** Mendeleyev **who** invented the periodic system of chemical elements. (**Именно** *Менделеев придумал периодическую систему химических элементов*.)

It is on cooling **that** water forms ice. (**Именно** *при охлаждении вода образует лед*.)

3.5.2. Конструкция **It is (was) not until (till) … that …** переводится предложением в утвердительной форме со словами "**только; только тогда, когда**". **It** на русский язык **не переводится**.

e.g. **It was not till** 1959 **that** chemists obtained this compound. (**Только** *в 1959 году химики получили это соединение*.)

III. Подлежащее может быть выражено **инфинитивом**. (**переводится** *неопределенной формой глагола или существительным*)
e.g. To know foreign languages is very important. (***Знать*** *иностранные языки очень важно*.)

IV. Подлежащее может быть выражено **герундием**.
e.g. Reading enriches our knowledge. (***Чтение*** *обогащает наше знание*.)

Ex. 18. ***Заполните пропущенное подлежащее личными местоимениями. Переведите.***
1) … is 25 years old. 2) … is a scientist. 3) … are friends. 4) Is … also a student? 5) … are not in Moscow. 6) … are postgraduate students of Ivanovo State University of Chemistry and Technology. 7) … is not very old. 8) … am a first-year postgraduate student. 9) Are … chemists? 10) … is one of my friends. 11) ... is my brother. 12) ... will be at home tomorrow. 13) Is ... your dictionary? 14) Are ... at work now? 15) Where were ... yesterday? 16) Why were ... absent last lesson? 17) In some years ... will be an experienced scientist. 18) Take this book. ... is very interesting. 19) Are ... able to answer my question? ... is very difficult. 20. … have two colleagues. 21. … has many friends. 22. … studied a lot of subjects at the University. 23. Does …have an English textbook? 24. … have chemistry today. 25. … will have English next week.

Ex. 19. ***Подчеркните подлежащее в предложениях. Переведите предложения на русский язык.***
1. To test the accuracy of the method is our main task. 2. It has become possible to modify the invention. 3. The efficiency of the process resulted in increasing the yield. 4. Evaporating of the mixture continued for as long as 2 hours. 5. One can say that there are unlimited sources energy in the world. 6. It is a very interesting phenomenon. 7. It is necessary to know the periodicity in the history of chemistry. 8. To compare the size of molecules is rather difficult. 9. Discussing the topic helped both of us to understand it better. 10. Heating liquids results in their expansion. 11. Chemical engineers' principal goal is to improve the technology of chemical production. 12. To explore the phenomenon is to learn everything about it. 13. In future, oil and coal are to be replaced by new fuels. 14. One must clearly understand the idea of chemical transformation. 15. One should be accurate in laboratory measurements.

Ex. 20. ***Определите, какие из выделенных слов являются подлежащими.***
1. **His heating copper wire** from 0° to 100° increased its resistance about 40%. 2. Many **methods** for **detection** of **uranium** have been proposed for **use** under various **conditions**. 3. **It** has become possible to modify the invention so as **to bring** out the structural features more clearly. 4. **It** takes **the rays** of **the sun** 8

minutes to get to the **earth**. 5. **To test the accuracy** of **the method** is our main task. 6. **Falling** is **a case** of **motion** at constant **acceleration**.

Ex. 21. ***Определите предложения, подлежащее которых имеет левое или правое определение.***

A) 1. You must aim at obtaining accurate results. 2. The efficiency of the process resulted in increasing the yield. 3. The automobile repair plant construction project is known to have been adopted. 4. Laplace transformation properties enable us to solve many problems in engineering and physics. 5. The data processing equipment has been installed in our laboratory. 6. In the radioactive bodies alpha, beta and gamma rays are emitted spontaneously. 7. Having been cooled for two hours the mixture was examined.

B) 1. Given the weight and the specific gravity of a body, you can calculate its volume. 2. One may expect this prediction to be quite reliable. 3. The problem of making quantitative chemical analysis is to determine the amount of one or more constituents in a given substance. 4. Radium whose properties are known to be of the greatest importance to the present day chemistry was isolated m 1910. 5. A precipitate which seems to be extremely slightly soluble may fail to be dissolved completely.

Ex. 22. ***Определите начало и конец группы подлежащего в следующих предложениях.***

1. Different substances used as leaching solutions are dealt with in this article. 2. The comparative simplicity of these cases depends on the masses of the substances. 3. Our engineer having been awarded the prize was met with approval. 4. The figures usually quoted to indicate the development of the Soviet economy during the five-year plan are these of steel, coal, oil, and energy production. 5. River and lake deposits contain remains of organisms which inhabited waters.

Ex. 23. ***Укажите, чем выражено подлежащее (группа подлежащего) в следующих предложениях.***

1. Every factor preventing the process from proceeding smoothly should be paid much attention to. 2. He ought to have been more careful when dealing with those chemicals. 3. Supplying heat to the liquid so as to raise its temperature will assist the process of evaporation. 4. To explain this simple fact is not so very easy. 5. Water was considered to be an element. 6. It is necessary to reduce the load on the battery to a minimum. 7. One has to liberate energy very rapidly.

Ex. 24. ***Выделите в следующих предложениях только подлежащие без относящихся к ним слов.***

1. This results in a further reduction in weight. 2. On being heated these salts decompose. 3. An up-to-date apparatus for use with powders is described in this article. 4. The double bond in ethylene giving this compound the property of being unusually reactive is beyond question now. 5. The reaction resulted in oxidation. 6.

The remaining admixtures were separated from the end product. 7. To carry out this reaction it was necessary to apply a new method. 8. To carry out this reaction was necessary. 9. Very little published information is available. 10. The findings of these researchers were substantiated by our experiments. 11. Before starting these reactions one must provide for low pressure.

Ex. 25. ***Переведите на русский язык «цепочку существительных»***

1. Hydrogen theory, 2. Faraday's studies, 3. water solution, 4. acid-base reaction, 5. semiconductor electronics, 6. radio engineering, 7. research methods, 8. research institute, 9. turbine installation, 10. production control, 11. power installation, 12. temperature control, 13. diffusion temperature, 14. Kurchatov Institute, 15. pressure source, 16. liquid pressure, 17. air compressor, 18. gas compressor, 19. air pressure, 20. steam pressure, 21. energy source, 22. light source, 23. radiation source, 24. information source, 25. energy level, 26. radiation law, 27. hydrogen atom, 28. water space, 29. plasma physics, 30. research reactors, 31. research tools, 32. energy-storage facility, 33. human purposes, 34. control area, 35. depth measurement, 36. gravity measurement, 37. height measurement, 38. radiation measurement, 39. energy problem, 40. power plant, 41. percentage composition, 42. atomic energy levels, 43. solid matter, 44. metal parts, 45. electronic density distribution, 46. solvent system, 47. acid-base neutralization reactions, 48. carbon monoxide, 49. rotation motion, 50. melting points, 51. hydrogen bond, 52. electron density, 53. electron transfer, 54. chloride ions, 55. wave properties

ОСОБЕННОСТИ ПЕРЕВОДА *it, one*

Ex. 26. ***Переведите предложения на русский язык, обращая внимание на функции "IT".***

A) 1. It was not known that the substance was heated. 2. It is important not to confuse the physical and the chemical properties of these materials. 3. It is the same substance, but it can exist in three physical forms. 4. It is work that produces heat in all these cases. 5. It must be said, that almost all solids expand more or less when heated. 6. It is probable that in the first place expansion takes place. 7. It is sufficient to examine only a few properties in order to identify the material. 8. It is not necessary to differentiate all the properties of the wire. 9. It is evident that the earth contains a large number of metals. 10. It was not until Roentgen discovered his mysterious rays that many diseases could be easily diagnosed. 11. From the experiments it is seen that chemical changes are often accompanied by an evolution of heat. 12. It is from such measurements that all values of wave lengths were determined. 13. It follows from the definition of a compound that its composition is independent of the method of preparation. 14. It was noticed in the 16^{th} century that this oxide is heavier than the metal. 15. It appears that the nature of the chemical action producing the hydrogen is very important. 16. The method makes it possible to work with high precision tools.

B) 1. It was believed that all the varieties of matter were brought about by a relatively few kinds of particles. 2. It is astonishing that a purely philosophical

guess about the structure of an atom was so completely confirmed. 3. An atom is no longer thought to be a fundamental particle, it consists of still smaller particles. 4. Knowledge about the electronic structure of atoms made it possible to systematize the facts of chemistry. 5. It was discovered that bonds hold atoms together. 6. It was in Greece that first ideas about the structure of matter appeared. 7. There are some unknown words in the text, translate it using a dictionary. 8. It was not until the 19th century that the periodicity of elements was discovered. 9. Bring the book, please, it is on the table. 10. It is a new law; you must clearly understand it.

C) 1. It is very important to find suitable engineering materials for every part of a machine or structure. 2. It was this engine that R.Diesel patented in 1892. 3. It is known that the charge of the proton is equal in size but opposite in sign to the charge of the electron. 4. It is impossible to consider them in this book. 5. This particle is very small. It cannot be seen. 6. It is impossible to formulate this idea precisely. 7. It was periodic table of elements that D.Mendeleyev discovered in 1869. 8. It was Yablokov who was the first to understand the advantage of a transformer. 9. The fact is that it is the Russian scientist Chernov who found "critical points". 10. Uranium is a very heavy silver-white metal, hard, it is reactive, it burns in air on warming, it takes fire in fluorine, sulphur combines with it at 500°. 11. It was not until 1930 that the third type of particles that make up atoms was discovered. 12.

Ex. 27. ***Переведите предложения на русский язык, обращая внимание на усилительные конструкции.***

1. It is the analytical chemistry that is regarded as the oldest field of chemistry. 2. It is M. V. Lomonosov who is the founder of Russian physics and chemistry. 3. It was my supervisor who advised me to use this apparatus. 4. It was Mendeleyev's periodic law which served as a key to discovering new elements. 5. It is not until a substance undergoes distribution that it has the same molecular weight in the two phases. 6. It was in 1869 that Mendeleyev's periodic system was published. 7. It is horizontal rows of the periodic table which are called periods. 8. It was not until oxygen was discovered that many processes could be understood. 9. It was not until the results concerning solid solutions had been obtained that a general conclusion was reached. 10. It was not till late in the 19th century that numerous household items began to be produced at factories. 11. It is not until two pieces of zinc and copper are brought into contact that they become electrified. 12. It is only at ordinary temperature that the agreement between the two methods is satisfactory.

Ex. 28. ***Переведите предложения на русский язык, обращая внимание на функции*** **"ONE".**

A) 1. To determine the density of a body one must know its mass and volume. 2. The chemical properties of ozone are similar to those of oxygen, but one must point out that ozone is more chemically active. 3. Now one can understand

chemical phenomena better by connecting chemical facts with the nature of the chemical bond. 4. One has to remember that this reaction is followed by an explosion. 5. Reliable experimental data enable one to draw proper conclusions. 6. One has to know that all objects are acted upon by gravitation forces. 7. If one knows the acceleration of a body, one can easily define its speed at any time after it has started its motion. 8. One can say that there are unlimited sources of energy in the world. 9. While making the experiment, one has to keep the temperature constant. 10. One can determine the specific gravity of the substance if one knows its weight and volume. 11. One finds the reason for this similarity in the periodic table. 12. In order to learn the properties of a substance one must have it in its pure form. 13. Observing the arrangement of atoms in a solid, one can understand its properties better. 14. It takes one much time to make all the calculations without a computer. 15. One knows that the heavier the nucleus, the denser the energy levels. 16. One thinks this hypothesis is doubtful. 17. One says that both bodies possess the same temperature, and that the flow of heat from one into another has stopped. 18. By adding heat to a solid body one transforms it into a liquid. By adding still more heat one may transform the liquid into a gas. 19. One may convert potential energy into kinetic one. 20. It was known that elements could unite with one another in more than one proportions but one should know that Dalton was the first to discover a simple relation between the different proportions in which the elements combine.

B) 1. An elementary substance is the one which consists of only one kind of atoms. 2. Red phosphorus is more stable than the white one. 3. Ductile materials have greater strength than brittle ones. 4. The salts formed by hydrochloric acid are called chlorides, the ones formed by sulphuric acid are called sulphides. 5. These machines are inefficient and that is why it is necessary to replace them by new ones. 6. According to the molecular theory of matter a hot body differs from a cold one in the state of motion of its particles. 7. Reactions of dilute acids and the concentrated ones are not alike. 8. Phosphorus exists in several allotropic modifications, yellow and red are the most common ones. 9. If we bring a hot body into contact with a colder one, the fast-moving molecules of the first will collide. 10. The fast molecules will gradually slow down, and the slow ones speed up. 11. This modern apparatus gives more accurate results than the old one and it is much easier to handle. 12. The transition elements are the ones that have their inner shells partly filled. 13. This approach is quite similar to the one just described. 14. The procedure is a simple one.

C) 1. Copper is one of the metals used in the prehistoric times. 2. One of the ways of obtaining oxygen is to decompose water by the electric charge. 3. Ethyl alcohol contains one hydrogen atom attached to an oxygen atom. 4. One way of classifying a solid is according to its electrical properties. 5. Hydrogen atom contains only one electron and one proton. 6. An element is a substance which consists of only one kind of atoms. 7. Phosphorus is one of the elements of Group V. 8. Phosphorus is readily dissolved in carbon disulphide, one part of it will dissolve nine parts of

phosphorus. 9. It is one of the simplest methods and it is often recommended to the students.

Ex. 29. Переведите предложения на русский язык, обращая внимание на функции "IT" , "ONE" .

1. They study organic processes and inorganic ones. 2. No one has ever observed this phenomenon. 3. It was my supervisor who advised me to use this apparatus. 4. One must know all the properties of this substance. 5. This method is simpler than that one. 6. Sodium is the only one of the alkali metals which is used industrially in large quantities. 7. No one could state the definite properties of this substance. 8. It is the analytical chemistry that is regarded as the oldest field of chemistry. 9. One may expect that this substance dissolves easily in water. 10. At one time the chemists took the weight of the hydrogen atom as the unit. 11. Hydrogen consists of particles, each one is made up of 2 hydrogen atoms. 12. The number of molecules of water is twice that of molecules of oxygen from which it is produced, that is each oxygen molecule is split into two equal reactive units. 13. It should be mentioned that metals in solid state are invariably crystalline. 14. It is horizontal rows of the periodic table which are called periods. 15. One should take into account that sulphides of many metals are used in paint industry. 16. Our new atomic stations are more powerful than the old ones. 17. One must be careful with explosive substances. 18. One of the greatest problems of our era is that of outer space. 19. Artificial diamonds are 40 per cent harder than natural ones. 20. It is not until two pieces of zinc and copper are brought into contact that they become electrified. 21. The distance that light travels in one second is 300 thousand kilometers. 22. It is the law of conservation of mass that makes possible the writing of chemical equation.

Тема 4

ВТОРОСТЕПЕННЫЕ ЧЛЕНЫ ПРЕДЛОЖЕНИЯ: ДОПОЛНЕНИЕ, ОБСТОЯТЕЛЬСТВО.

ДОПОЛНЕНИЕ

Дополнение – "дополняет" высказывание, обозначает то лицо или предмет, на который направлено действие, совершаемое лицом или предметом, выраженным подлежащим.

Дополнение может быть:	**1.** ***прямое*** – лицо или предмет, на которое прямо направлено действие ***e.g.*** This article contains ***valuable data***. (*Эта статья содержит ценные данные*.)
	2. ***косвенное*** – стоит между сказуемым и прямым дополнением, означает адресат действия ***e.g.*** He showed ***me*** his data. (*Он показал мне свои данные*.)
	3. ***предложное*** – стоит после прямого дополнения, вводится любым предлогом ***e.g.*** He compared his data ***with the conclusions*** of other authors. (*Он сравнил свои данные с выводами других авторов*.)

Способы выражения дополнения

Дополнение может быть выражено:	1) ***личным местоимением в объектном падеже*** (***me, you, him, her, it, us, them***) ***e.g.*** I haven't seen ***them***. (*Я не видел их*.)
	2) ***существительным*** ***e.g.*** They investigated ***this problem*** last year. (*Они исследовали эту проблему в прошлом году*.)
	3) ***инфинитивом (инфинитивным оборотом)*** ***e.g.*** I don't like ***to deal*** with chemicals. (*Я не люблю иметь дело с химикатами*.)
	4) ***герундием*** ***e.g.*** He likes ***reading newspapers***. (*Ему нравится читать газеты*.)

Формальное дополнение it.

После глаголов **to think** (*думать*), **to make** (*делать*), **to find** (*находить, считать*), **to consider** (*считать, полагать*), **to believe** (*полагать*) и др.

e.g. Modern methods ***made*** **it** profitable to extract copper from ores. (*Современные методы сделали выгодным извлечение меди из руд*.)

We ***find*** **it** important to finish this work before 5 o'clock. (*Мы считаем важным закончить эту работу до 5 часов*.)

Дополнение может иметь при себе ***левые*** и ***правые определения***.

e.g. They investigate the great ***forces*** acting on these substances. (*Они исследуют значительные силы, действующие на эти вещества*.)

ОБСТОЯТЕЛЬСТВО

Обозначает ***где, когда, как*** совершается действие.

(now, every day, yesterday, tomorrow, today, here, there, last week, again, slowly, quickly, often, never, etc.)

Ex. 30. Переведите предложения на русский язык, обращая внимание на дополнение, обстоятельство, определение

1. They were glad to have obtained such good results in the latest tests of the new model. 2. You must aim at obtaining accurate results. 3. I like translating technical articles from English into Russian. 4. Acids contain hydrogen. 5. He gave me a new article. 6. I sent the article to the journal. 7. The researcher calculated the amount of work used for producing a given amount of heat. 8. This vessel is used for containing gases. 9. Scientists become interested in new logical problems. 10. It is often necessary to have a detailed knowledge of this subject. 11. Modern industry needs considerable quantities of iron. 12. Iron possesses magnetic properties. 13. In the molten state this substance is very fluid. 14. Non-metallic components of this substance contain a certain amount of carbon. 15. This material was used in different experiments because of its characteristic properties. 16. These ions were produced simply by dissolving the electrolyte in the solvent. 17. It is sometimes impossible to imagine the actual reaction mechanism by which the system approaches equilibrium. 18. As long ago as 1833, both scientists made this important comclusion.19. In order to understand such concepts, it is necessary to have a more detailed picture of the structure of the solvent molecules. 20. It is often necessary to understand interactions in electrolyte solutions.

СТЕПЕНИ СРАВНЕНИЯ ПРИЛАГАТЕЛЬНЫХ И НАРЕЧИЙ

Имена прилагательные образуют две степени сравнения: ***сравнительную*** и ***превосходную***.

Прилагательные односложные образуют *сравнительную степень* путем прибавления к форме прилагательного в положительной степени суффикса –**er**. Превосходная степень образуется путем прибавления суффикса –**est**:

Положительная степень	Сравнительная степень	Превосходная степень
sharp(острый)	sharp***er***	the sharp***est***
cold (холодный)	cold***er***	the cold***est***
deep (глубокий)	deep***er***	the deep***est***

По этому же способу образуются степени сравнения двусложных прилагательных, оканчивающихся на ***-y, -er, -ow, -ble***:

Положительная степень	Сравнительная степень	Превосходная степень
busy (занятый)	busi***er***	the busi***est***
dirty (грязный)	dirti***er***	the dirti***est***
clever (умный)	clever***er***	the clever***est***
narrow (узкий)	narrow***er***	the narrow***est***

Этим путем образуют степени сравнения также ряд других двусложных прилагательных:

Положительная степень	Сравнительная степень	Превосходная степень
simple	simpl***er***	the simpl***est***
common	common***er***	the common***est***

Большинство прилагательных *двухсложных*, а также прилагательные, состоящие из *трех* или *более* слогов, образуют сравнительную степень при помощи слова **more**, а превосходную – **most.** Эти слова ставятся перед прилагательным в форме положительной степени:

Положительная степень	Сравнительная степень	Превосходная степень
active	***more*** active	the ***most*** active
difficult	***more*** difficult	the ***most*** difficult
interesting	***more*** interesting	the ***most*** interesting

Некоторые прилагательные образуют степени сравнения от *другого корня*, как и соответствующие слова в русском языке:

Положительная степень	Сравнительная степень	Превосходная степень
good	better	the best
bad	worse	the worst
little	less	the least
much, many	more	the most
far	farther	the farthest
	further	the furthest

ПРИМЕЧАНИЕ

1) the … the … в сочетании с прилагательными в сравнительной степени переводится "чем … тем":

e.g. The more we read the more we learn. (*Чем больше мы читаем, тем больше мы узнаем*.)

The higher the temperature, the greater are the yields. (*Чем выше температура, тем больше выход продукта*.)

2) Для сравнения двух предметов *одинакового* качества прилагательное в *положительной* степени ставится между **as…as** со значением *такой же* …

как, так же …как: ***e.g.*** My dictionary is **as good as** yours. (*Мой словарь такой же хороший, как ваш*.)

Ex. 31. Переведите предложения на русский язык, обращая внимание на степени сравнения прилагательных.

A) 1. What is the nearest way to the station? 2. The more you read, the more you know. 3. This is the most interesting experiment we have ever seen. 4. Mike was the most experienced of all the researchers. 5. This lecture will give you more information than any book. 6. The stronger is the acid, the greater is the tendency to lose protons. 7. The faster the object moves, the greater is the air resistance. 8. The bigger the mass, the bigger the weight of the body. 9. Most elements exist in different forms. 10. Iron is the most important material in industry. 11. Most of all the scientists investigated radioactive elements. 12. We need mostly the polymers which withstand high temperatures. 13. The lower the temperature, the more easily the gas is liquefied.

B) Самая низкая температура, самая высокая точка, самое большое число, самый интересный проект, самый современный метод исследования, самое трудное слово, наиболее полезный прибор, самое современное производство, самая блестящая идея, более ранние результаты.

Тема 5
ПРИЧАСТИЕ (PARTICIPLE)

PARTICIPLE I
V + ing
asking
making

PARTICIPLE II
V + ed (3 ф. гл.)
asked
made *(см. таблицу неправ. глаголов)*

ФОРМЫ ПРИЧАСТИЙ

Формы причастий	Active Voice (действительный залог)	Passive Voice (страдательный залог)
Present Participle (*Participle I*)	**V-ing** ***asking*** 1. спрашивающий 2. спрашивая	**being V-ed / 3 ф. гл.** ***being asked*** 1. спрашиваемый 2. будучи спрошенным
Past Participle (*Participle II*)	_____	**V-ed / 3 ф. гл.** **asked** 1. спрошенный 2. спрашиваемый
Perfect Participle	**having V-ed / 3 ф. гл.** ***having asked*** спросив	**having been V-ed / 3 ф. гл.** ***having been asked*** после того, как спросили

ФУНКЦИИ ПРИЧАСТИЙ В ПРЕДЛОЖЕНИИ

1. Часть сказуемого (be + *ing;* be + *ed* (см. таблицу времен глагола) – *переводится личной формой глагола*

e.g. I am *translating* an article now. (*Сейчас я перевожу статью*.)

The article was *translated* by the students. (*Статья была переведена студентами*.)

2. Определение (левое или правое)

e.g. They looked at the *boiling* water. (*Они смотрели на кипящую воду*.)

The experiment *being carried out* in our laboratory is very important for our work. (*Эксперимент, выполняемый в нашей лаборатории, очень важен для нашей работы*.)

The decision *made* didn't result in high efficiency. (*Принятое решение не привело к большой производительности*.)

NOTE! Если в предложении 2 глагольные формы с окончанием **–ed** стоят подряд, то первая из них – ***ПРИЧАСТИЕ*** в функции определения, а вторая – ***СКАЗУЕМОЕ*** в прошедшем времени.

e.g. The substance *obtained* contained some admixtures.
(*Полученное вещество содержало несколько примесей.*)

3. Обстоятельство (*времени, причины, образа действия*) обычно находится в начале или в конце предложения, часто с союзами ***when***, ***while*** (которые **НЕ ПЕРЕВОДЯТСЯ**!)

e.g. *Having considered* the matter, we came to a definite conclusion. (*Рассмотрев этот вопрос, мы пришли к определенному заключению.*)
When *cooled* water becomes ice. (*При охлаждении, вода превращается в лед. / Будучи охлажденной, вода превращается в лед.)*

НЕЗАВИСИМЫЙ (САМОСТОЯТЕЛЬНЫЙ) ПРИЧАСТНЫЙ ОБОРОТ

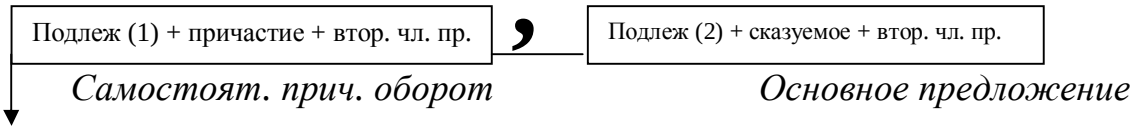
- это причастный оборот со своим подлежащим.

ПРИЗНАКИ НЕЗАВИСИМОГО ПРИЧАСТНОГО ОБОРОТА:

1) оборот всегда отделяется от основной части предложения **запятой**,
2) оборот начинается с подлежащего (1 место), за которым следует причастие (2 место), которое при переводе выполняет **роль сказуемого**.

2 типа независимого причастного оборота

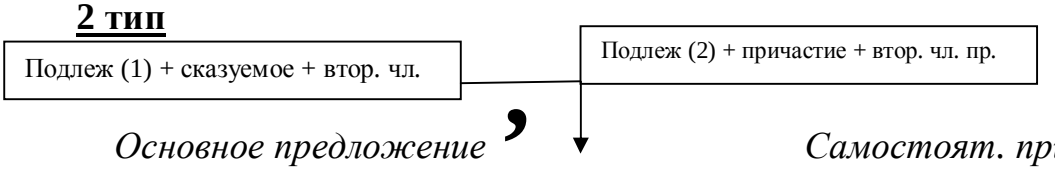
1 тип



Союзы: ***когда, после того как, если, так как, ввиду того что***

e.g. [This machine working well], we use it at our factory. (***Так как*** *эта машина хорошо работает, мы используем ее на нашем заводе*.)

2 тип



Союзы: ***причем, при этом, а, и, но***

e.g. The scientist was making an experiment, **[**two assistants helping him**]**. (*Ученый проводил эксперимент, **и** два лаборанта помогали ему*.)

NOTE! Самостоятельный причастный оборот может начинаться с предлога ***with***, который на русский язык **НЕ ПЕРЕВОДИТСЯ**.

e.g. **[**With the experiments having been finished**]**, we started new investigations. (***После того как*** *эксперименты были закончены, мы начали новые исследования*.)

МОДЕЛИ –ing, –ed

–ed	1) сказуемое, часть сказуемого (см. таблицу видо-временных форм глагола) ***e.g.*** He has never investigated this problem. (*Он никогда не исследовал эту проблему*.)
	2) причастие (модель перевода: ДЕЛАЕМЫЙ, СДЕЛАННЫЙ) ***e.g.*** The investigated problem was very important. (*Исследуемая проблема была очень важна*.)
–ing	1) часть сказуемого (см. таблицу видо-временных форм глагола) ***e.g.*** He is investigating this problem now. (*Сейчас он исследует эту проблему*.)
	2) причастие (модель перевода: ДЕЛАЮЩИЙ) ***e.g.*** The scientist conducting the experiment was from our laboratory. (*Ученый, проводящий опыт был из нашей лаборатории*.)
	3) рус. деепричастие (чаще при наличии «,») ***e.g.*** Investigating the problem, he came to the conclusion that … (*Исследуя проблему, он пришел к заключению, что …*)
	4) герундий (при наличии предлогов in, with, by, at) (модель перевода: ПРИ ДЕЛАНИИ) ***e.g.*** By investigating the problem he came to the conclusion … (*При исследовании проблемы, он пришел к заключению, что …*)

Ex. 32. Переведите предложения на русский язык. Подчеркните причастия. Определите функции причастий в предложении.

A) 1. The student translating the article is my brother. 2. The article translated by the student is difficult. 3. The student is translating an article about liquids. 4. The student has translated an article. 5. The article is translated by the student. 6. The article is being translated by the student now. 7. Translating an article, the student used a dictionary. 8. Having translated the article, the student gave it to the teacher. 9. Having been asked to translate the article, the student translated it very well. 10. The work done by the scientists was very important. 11. Not knowing her address, I can't send her a letter. 12. Having finished the work, he left the laboratory. 13. Hearing the news, I called him at once. 14. While working on my report, I read a lot of interesting articles. 15. While we were crossing the bridge, we saw Mr. Brown, who was talking with his friend. 16. The discovery made is of great value.

B) 1. Electric current is employed in our everyday life. 2. At present, only a little part of solar energy is being used. 3. The energy sources of the world are decreasing. 4. These rays uninfluenced by the magnetic field were examined by our scientists. 5. No temperature change was observed in the sample used. 6. Solids can be changed to gases when they are heated. 7. When a liquid is heated the molecules move faster. 8. Many experiments have been carried out in the field

of radioactivity. 9. A mechanical method was substituted by a new one. 10. The factory has been producing artificial fibers for ten years. 11. This shop is producing new optical devices. 12. The substance being investigated can be used in this experiment.

C) 1. The machines producing these goods must be new. 2. The work done by these research-workers resulted in many new discoveries. 3. The turbines, driven by the kinetic energy of the running water, turn electric generators. 4. The construction of power stations operating on atomic fuel is necessary. 5. There is a simple relationship between the acting force and the resistance force. 6. The scientist found that the X-rays produced were complex. 7. The nuclei formed in this reaction are unstable. 8. A positively charged particle having the mass of the electron was discovered in 1932. 9. The dissolved materials can be soluble solids, liquids or gases. 10. Atoms contain uncharged particles called neutrons. 11. The plant producing these goods was built last year. 12. The discovery followed by many experiments resulted in new investigations in chemistry. 13. Water falling from its raised position changes potential energy into kinetic energy. 14. The experiment being carried out in our laboratory is very important for my work. 15. A positively charged particle having the mass of the electron was discovered in 1932. 16. The scientist found that the X-rays produced were complex. 17. The method involved depended on a number of factors described earlier. 18. Experiments made with various elastic materials have shown that there is a simple relationship between the acting force and the resistance force. 19. A given molecule is able to move within the liquid from place to place. 20. According to this theory dealing with atomic structure the nucleus is a very small, compact, central part of an atom. 21. Oppositely charged particles exert forces of attraction on one another. 22. Elements composed of atoms containing only one or two valence electrons usually form positive ions. 23. The investigation followed by many experiments was of great importance. 24. The nuclei formed in this reaction are unstable. 25. A piece of iron placed in a container with an acid can diminish in mass. 26. The analysis followed by an examination gave unexpected results. 27. The substance affected by a magnetic field must be a metal. 28. The experiments carried out in our laboratory resulted in many new investigations the field of ceramics. 29. The energy produced by the splitting of the nucleus of an atom is called "nuclear" or atomic energy. 30. Mostly atoms contain uncharged particles called neutrons. 31. The dissolved materials may be soluble solids, liquids or gases. 32. Water used in steam boilers, should be free from substances that cause corrosion. 33. The work done by the scientists was of great significance. 34. The fibers investigated by them were strong enough. 35. This type of radiation consists of a current of positively charged particles. 36. The plant producing these goods was built last year.

D) 1. Being in London, I could not help my parents. 2. Investigating this phenomenon the scientists can make some important conclusions. 3. Being carried in our laboratory the experiment can be studied thoroughly by our students. 4.

Working at this new device, the inventor made numerous experiments. 5. Being a source of heat and power, atomic energy can also serve as a source of new useful products. 6. Using semiconductors, scientists have transformed solar energy into electric energy. 7. If carried out carefully, the experiment can give reliable data. 8. Having investigated all the properties of new water, they could understand the mystery of silver clouds. 9. Producing new kinds of materials one should be particular about their quality. 10. Having purified the water from the substance that cause corrosion, we can use it in steam boilers.

Ex. 33. Выделите в предложениях независимый причастный оборот (Absolute Participial Construction). Переведите предложения на русский язык.

A) 1. My work being very difficult, he helps me. 2. Mendeleyev being a great chemist, his name is well known not only in Russia but also abroad. 3. The scientist having carried out his investigations in the laboratory, we could ask him about the results. 4. The student knowing English well, the examination did not last long. 5. The work finished, we went home. 6. The weather being fine, they went for a walk. 7. The speed of light being extremely great, we cannot measure it by ordinary means. 8. Radioactivity having been discovered, science made great progress in atomic physics. 9. The energy sources of the world decreasing, it is necessary to use atomic energy. 10. The article deals with metals, most of them being excellent conductors. 11. All preparations being made, they started the experiment. 12. The problem being easy, the students solved it at once. 13. The lecture being over, they went home. 14. The test being completed, the researchers write down the results. 15. The inventor was demonstrating his new device, the workers watching its operation attentively. 16. There being many people in the conference hall, we could not enter it. 17. With our laboratory assistants helping us, we continued our work. 18. There are two diagrams on this page, one of them showing the relation between volume and temperature.

B) 1.The experiment finished, hydrogen peroxide was obtained. 2. A lot of experiments made, Davy isolated potassium on October 6. 1807. 3. Oxygen combines with most elements, the product formed being called an oxide. 4. A long series of experiments having been carried out, they determined what equipment modifications would be necessary. 5. The method of preparation being the best of the methods described, we used it in our work. 6. The properties of these substances having been established in our laboratory, we started new experiments. 7. The formula of a compound being known, we can calculate its molecular weight. 8. Hydrogen is now used in large quantities industrially, most of it being obtained from water gas. 9. The specific heat of solid element being known, the approximate atomic weight can be calculated. 10. The gas being colourless, we didn't notice its formation. 11. Hydrogen being the lightest of elements, its density is the smallest of all substances. 12. The charge of the electron having been determined, it was easy to calculate its mass. 13. The melting point having been discovered, it was possible to continue our research work. 14. All the properties of

the element having been discovered, it was much easier to use it. 15. Hydrogen burns in air with almost colourless flame, water being produced. 16. The new computer having been built, they could calculate the acceleration of the particles. 17. The data having been obtained, we discussed the results at the conference. 18. The electron is about as large as nucleus, its diameter being about 10^{-12} cm. 19. A gas can be dissolved in a liquid, the liquid changing its boiling point. 20. The elements having been arranged in the Periodic Table, it became easier to predict new elements. 21. Non-metallic materials are of great importance, some of them being widely used in place of metals. 22. Molecules are in constant motion, the motion becoming more rapid with the increase of temperature. 23. This material being used in electronics, its properties should be studied thoroughly.

Ex. 34. Переведите предложения на русский язык, обращая внимание на причастие.

1. One should follow the proceeding reaction very carefully. 2. Selenium, an element belonging to the sulphur group, is as much non-metal as metal. 3. Many factors mentioned determine the reaction rate. 4. The amount of the pure metal certain to be obtained for the ore can be calculated in the following way. 5. The phenomena likely to arise during the experiment must also be taken into account. 6. The boiling point of water is accepted to be 100°C. 7. Some objections were found to the Arrhenius theory long believed to be true. 8. Dangerous bacteria in drinking water may be killed by small amounts of chlorine. 9. An acid is defined as a compound or an ion capable of liberating a proton. 10. Two or more atoms having identical nuclear charges but different numbers of neutrons are said to be isotopes. 11. Ores containing as little as 2 per cent or even less of copper or nickel are worth mining. 12. Bond formation involving elements toward the middle of the periodic table occurs by the process of electron sharing. 13. There are a number of different procedures being used in qualitative analysis. 14. The calculation of hydrogen ion concentration in a solution containing a weak electrolyte is a difficult one for the average student first facing this problem. 15. Sulphur dioxide is more than twice as heavy as air and is one of the most easily liquefied gases known. 16. The term "heat" of combustion refers to the amount of heat liberated per mole of the substance burned. 17. Many industrial processes depend for their success upon the solubilities of the compounds formed. 18. The system of chemical symbols now used was proposed by the Swedish chemist Berzelius in 1818. 19. Fluorine, though for a long time known to exist, was not isolated until 1886. 20. An element is represented by certain letters for ease in writing. 21. The question of the composition of air long supposed to be one of the elements was solved only in the 18th century.

Ex. 35. Переведите предложения на русский язык. Выделите предложения, где есть независимый причастный оборот (Absolute Participial Construction).

1. Heating the substance, one must be very attentive. 2. While moving, molecules collide with each other. 3. Having finished the experiment, we must process the

data. 4. Studying the properties of any substance, the chemist has to perform a number of experiments. 5. Our assumption confirmed, we could continue the experiment. 6. The lecture being over, we shall have a long break for dinner. 7. Having discovered the law of periodicity of the chemical elements, Mendeleyev made his greatest contribution to the development of chemistry. 8. Other things being equal, pressure grows proportionately to the temperature. 9. Having made a number of experiments with calcium and sulphuric acid at the temperature of 40°C, the Russian engineer Petrov was the first to put forward the problem of chemical activation. 10. One must be very careful when heating potassium chlorate. 11. Any element when combining with oxygen forms an oxide. 12. While dealing with chemicals in a laboratory, one can't do without such apparatus as funnels, beakers and so on. 13. Once discovered, the periodic system of the elements received much scientific attention. 14. Unless otherwise stated, volumes of gases always refer to standard conditions of temperature and pressure. 15. No substance can be considered chemically dry unless specially treated. 16. Large pieces of sodium may produce dangerous explosions if placed on water. 17. Sodium hydroxide is prepared industrially by two general methods, the oldest being the reaction of sodium carbonate and calcium hydroxide. 18. Hydrogen peroxide being added to an acidified solution of potassium permanganate, bubbles of gas are evolved, the gas evolved being oxygen. 19. The formula of a compound being known, we can calculate its molecular weight. 20. The liquid state being intermediate between the solid and gaseous state, the properties of the liquids show similarities to those of both solids and gases. 21. Cobalt and nickel are much more resistant to atmospheric oxidation than iron, with nickel being especially resistant. 22. Considered from this point of view, the reaction mechanism seems to depend only on the following three factors. 23. Having analysed the data, the author found that they were in agreement with the theory. 24. Having been heated to 100°C, water began to boil. 25. Except where otherwise stated, the measurements were taken at room temperature.

Тема 6
ГЕРУНДИЙ (THE GERUND)

Образование: V + ing

ФОРМЫ ГЕРУНДИЯ

	Active Voice	Passive Voice	Примечание
Indefinite Gerund	***V + ing*** **reading**	***being + V_3*** **being read**	Указывает на действие: 1) ***одновременное*** с действием глагола-сказуемого; 2) относящееся к ***будущему*** времени; 3) ***безотносительно*** ко времени его совершения
Perfect Gerund	***having + V_3*** **having read**	***having been + V_3*** **having been read**	Указывает на действие, ***предшествующее*** действию, выраженному глаголом-сказуемым

Функции Герундия и способы его перевода

1. Подлежащее (переводится *существительным, инфинитивом, придаточным предложением*)	*Reading* is his hobby. (*Чтение – его хобби.*) It is useful *learning* rules. (*Полезно изучать правила.*)
2. Часть сказуемого (переводится *существительным, инфинитивом*)	His favourite sport *is swimming*. (*Его любимый спорт – плавание.*) He *finished reading* the book. (*Он закончил читать книгу.*)
3. Дополнение (переводится *сущ., инфинитивом, придаточным предложением*)	He was busy *reading* the article. (*Он был занят чтением книги.*) He insisted on *discussing* the problem. (*Он настаивал на обсуждении проблемы.*)
4. Определение (часто после предлога ***of***) (переводится *существительным, инфинитивом, прилагательным*)	I like the idea of *reconstructing* the plant. (*Мне нравится идея реконструировать завод.*)

5. Обстоятельство (переводится *деепричастием*, *существительным*, *инфинитивом*, *придаточным предложением*) (После предлогов *in, on, by, after, without, before*, etc.)	Instead of *going* home he continued his work in the lab. (*Вместо того чтобы идти домой, он продолжил работать в лаборатории.*)

Герундий употребляется:

I. после ***глаголов***: **to account for** (*объяснять*), **to aim at** (*стремиться*), **to begin**, **to continue**, **to depend on (upon)** (*зависеть от, полагаться на*), **to give up** (*отказываться, бросать*), **to go on** (*продолжать*), **to insist on (upon)** (*настаивать*), **to keep on** (*продолжать*), **to mind** (*возражать*), **to prevent from** (*мешать, препятствовать*), **to rely on** (*полагаться*), **to be responsible for** (*объяснять что-л.*), **to result from** (*проистекать*), **to result in** (*приводить к*), **to stop** (*останавливаться, переставать*), **to succeed in** (*удаваться*)

II. после ***предлогов***: **apart from** (*кроме*), **because of** (*из-за*), **due to** (*благодаря*), **except** (*кроме*), **in addition to** (*кроме, в дополнение*), **in spite of** (*несмотря*), **instead of** (*вместо*), **on account of** (*из-за*)

ГЕРУНДИАЛЬНЫЙ ОБОРОТ

Структура: сочетание герундия с определением перед ним, выраженным либо притяжательным местоимением, либо существительным в притяжательном или общем падеже

		1) сущ. в общем падеже		
(Предлог)	**+**	**2) сущ. в притяжат. падеже**	**+**	**герундий**
		3) притяжат. местоимение		

Герундиальный оборот переводится, придаточным предложением, тип которого соответствует его функции в предложении. *Существительное* или *местоимение* перед герундием становится **подлежащим** (иногда **дополнением**), а *герундий* – **сказуемым**.

Функции герундиального оборота в предложении

1. *Функция подлежащего:* ***e.g.*** **His reading books in English** helps him in his work. (*То, что он читает книги на английском, помогает ему в работе*.)

2. *Функция дополнения:* ***e.g.*** I don't mind **my friends going to the lab**. (*Я не возражаю, чтобы мои друзья шли в лабораторию*.)

3. *Функция определения:* ***e.g.*** There was no hope **of our getting such results**. (*Не было надежды, что мы получим такие результаты*.)

4. *Функция обстоятельства:* ***e.g.*** **On his coming to the lab** he saw the students near the new unit. (*Когда он пришел в лабораторию, он увидел студентов рядом с новой установкой*.)

Ex. 36. Переведите предложения на русский язык, обращая внимание на герундий.

A) 1. Studying well is the duty of every student. 2. Finding new sources of electric energy is a most important problem. 3. Studying foreign languages is necessary for future specialists. 4. Learning English is not an easy thing. 5. Scientific thinking is very important for every researcher. 6. Discussing the topic helped both of us to understand it better. 7. Working in the laboratory is the most important step in training chemists. 8. Adding small quantities of other substances to alloys changes their properties, sometimes to a great extent. 9. Being very soft is characteristic of both calcium and sodium. 10. There is no denying that application of the quantum theory to chemistry stimulated its development. 11. Sometimes, preparing substances requires less skill than keeping them. 12. Learning to work accurately is not an easy task. 13. Investigating the weights and properties of elements led him to the discovery of his world-known law. 14. The rules of operating this machinery are very simple. 15. There are many methods of solving this problem. 16. There are some ways of obtaining high quality alloys. 17. In English, we have the practice of naming chemical elements in Greek and Latin.

B) 1. You must go on working. 2. We are sure of getting only good marks at the exams. 3. He is interested in playing chess. 4. He was glad of carrying out this work so well. 5. On coming home, my father began reading the magazine. 6. Newton was interested in making experiments since he was a student at Cambridge. 7. He likes asking all sorts of questions, but he doesn't like being asked questions. 8. He likes reading. 9. He avoids making complex calculations. 10. There is no need doing it at once. 11. S. V. Lebedev succeeded in making the first synthetic rubber in the world. 12. Don't use this apparatus, it wants repairing. 13. Alchemists succeeded in both preparing a number of new elements and inventing useful pieces of apparatus. 14. They were sorry for having missed the last lecture. 15. Alkali metals are capable of reacting with a number of the non-metals, forming binary products, e. g., chlorides, bromides, etc. 16. Mendeleyev's wide interests in various sciences did not prevent him from taking part in social life. 17. Under ordinary conditions the precipitate may fail to begin forming. 18. It is necessary to practise identifying the constituent elements of a sample. 19. The fundamental chemical laws are worth studying. 20. The conference will be very interesting, we cannot help going there.

C) 1. In studying the properties of a solution, it is desirable to know its composition. 2. On returning, we shall continue our investigation. 3. In studying a foreign language, one must learn a lot of foreign words by heart. 4. You are not allowed to work in the laboratory without learning the safety instruction. 5. Carbon burns in oxygen on strong heating. 6. The chemical properties of ozone are similar to those of oxygen except for its being more active. 7. Silicon resembles carbon in forming a series of volatile hydrides. 8. In dealing with crystals, one first encounters ions — atoms or groups of atoms carrying electrical charges. 9. A catalyst is defined as a substance that will change the rate of a chemical reaction without itself being changed. 10. Two elements may combine spontaneously upon being mixed or under special conditions. 11. We get much information by reading. 12. Learning rules without examples is difficult. 13. The answer is obtained by examining the characteristics of metals. 14. Equipment was used many years without being repaired. 15. On coming home he looked through the newspaper. 16. After obtaining good results he reported on his work. 17. Before using the machine examine it. 18. Liquids and gases expand on heating. 19. In building new metallurgical works, engineers have to solve many different problems. 20. Before working in the laboratory, students must learn what measures should be taken against being poisoned by chemicals.

Ex. 37. Переведите предложения на русский язык, обращая внимание на герундиальный оборот.

1. The problem is the students' studying regularly. 2. They saw the machine being stopped in the field. 3. Our making many experiments helped us to understand this reaction. 4. Before his becoming a student he had worked at the factory. 5. Their examining the steam engine themselves is very useful. 6. The equipment working without stopping is very important. 7. Her studying a second foreign language shows that she is interested in getting education. 8. Newton's having stated his laws of motion is very important for modern science. 9. After his having investigated this strange phenomenon he succeeded in solving this problem. 10. The professor's coming so early surprised us. 11. We objected to your going there. 12. They insisted on this experiment being made once more. 13. The rule against visitors entering the lab at the time of the experiment is strict. 14. His having carried out the measurements so easily doesn't surprise us. 15. Their having failed to distinguish between these phenomena seems strange enough. 16. Scientists' working together is of great advantage for science. 17. Owing to Petrov's reading many English books he knows the language very well. 18. Mendeleyev's having discovered the Periodic Law made a revolution in chemistry. 19. Curie's having discovered the phenomenon of radioactivity resulted in many investigations in this field. 20. We insisted on their obtaining the experimental data. 21. Everybody knows of D. I. Mendeleyev's having organized the Chamber of Weights and Measures in Russia. 22. I don't mind my sister's taking my notes. 23. The student denied the laboratory assistant having helped him with the experiment. 24. Now I am very careful in the laboratory, I can't forget my having burnt my left hand with an acid. 25. Excuse my being late. 26. Their coming to St. Petersburg was quite

unexpected. 27. Our article being accepted in the *Journal of Analytical Chemistry* is a great honour to us.28. Bohr's being awarded the Nobel prize was an international recognition of his great achievement. 29. Lebedev's having prepared synthetic rubber paved the way to the synthesis of other materials. 30. We know of his studying organic chemistry. 31. The professor knew about our going to the power station. 32. We didn't know about his being sent to the power station. 33. I remember my having told her about the experiment. 34. Professor N's participating in this conference attracted many other scientists. 35. His having made detailed notes at the lecture helped him to successfully pass the examination. 36. He insisted on his device being tested.

Тема 7
Инфинитив (THE INFINITIVE)

Формальным признаком инфинитива является частица ***to***.

НО! Инфинитив может употребляться и без частицы ***to***:

1. после модальных глаголов ***must, can (could), may (might), need***.
   e.g. You must ***do*** it immediately.
2. после глаголов ***to make*** (*заставлять*), ***to have*** (*заставлять, допускать, велеть*), ***to let*** (*разрешать*)
   e.g. What makes you ***think*** so? (*Что заставляет Вас так думать?*)

ФОРМЫ ИНФИНИТИВА

Voice / Tense	**Active**	**Passive**
Indefinite Infinitive	**to ask** спрашивать (*вообще*)	**to be asked** быть спрошенным (*вообще*)
Continuous Infinitive	**to be asking** спрашивать (*в определенный момент*)	—
Perfect Infinitive	**to have asked** спросить (*до определенного момента*)	**to have been asked** быть спрошенным (*до определенного момента)*

Функции инфинитива в предложении

1. Подлежащее (на русский язык переводится *неопределенной формой глагола* или *существительным в именительном падеже*)	***e.g.*** ***To use*** this method is very important. (***Использовать*** этот метод очень важно.)
2. Часть сказуемого (на русский язык переводится *неопределенной формой глагола*)	**а)** после глагола-связки ***to be***, когда подлежащее выражено существительными: ***purpose/ object/ aim*** (*цель*), ***task*** (*задача*), ***way*** (*путь, способ*), ***method*** (*метод, способ*), ***wish*** (*желание*), ***intention*** (*намерение*), ***problem*** (*вопрос, задача*)). ***e.g.*** Our aim **is to become** good specialists. (*Наша цель состоит в том, чтобы стать хорошими специалистами.*)

	В других случаях ***to be*** перед глаголом выражает *долженствование* ***e.g.*** These students **are to become** economists. (*Эти студенты* ***должны стать*** *экономистами*.) **б)** после модальных глаголов; после глаголов, обозначающих начало, продолжение, завершение действия; после глаголов ***to want***, ***to intend***, ***to try***, ***to hope***, ***to promise***, ***to decide*** (которые без инфинитива не дают полного смысла). ***e.g.*** He **began to use** the device. (*Он* ***начал использовать*** *это оборудование*.)
3. ДОПОЛНЕНИЕ (переводится *неопределенной формой глагола* или *придаточным предложением*)	***e.g.*** The manager asked me **to wait** a little. (*Управляющий попросил меня немного* ***подождать***.) ***e.g.*** He remembered **to have read** the article before. (*Он помнил,* ***что читал эту статью до этого***.)
4. ОПРЕДЕЛЕНИЕ (переводится определительным придаточным предложением с союзом ***который***, сказуемое выражает **долженствование** или **будущее время**)	***e.g.*** The result **to be expected** is important for our work. (*Результат,* ***который следует ожидать****, важен для нашего исследования*.)
5. ОБСТОЯТЕЛЬСТВО (переводится *придаточным предложением* с союзом ***чтобы, для того чтобы***)	***e.g.*** **To use** this method the scientist needed new equipment. (***Чтобы использовать этот метод****, ученому было необходимо новое оборудование*.) - Иногда употребляется с союзами ***in order to***, ***so as*** (***чтобы, для того чтобы***) ***e.g.*** **In order to use** this method … (***Чтобы использовать этот метод*** …)

NB **СЛЕДУЕТ РАЗЛИЧАТЬ** инфинитив в функции ***обстоятельства*** и ***подлежащего***, который употребляется в начале предложения. Для этого надо:

1) Найти **подлежащее** и **сказуемое**

2) Если в предложении есть подлежащее, которое выражено не инфинитивом, значит инфинитив в начале предложения – обстоятельство

Ex. 38. Переведите предложения на русский язык, обращая внимание на различные функции инфинитива.

A) 1. To translate this article is not an easy thing to do. 2. To study much is to learn much. 3. To master a language one must work much. 4. To see things in a simple way is the job of a physicist. 5. To introduce numerical methods and their use in physics is the purpose of the paper. 6. To interpret these results in terms of your concept is rather difficult. 7. To analyse a substance means to define its components. 8. To have a laboratory practice work is very useful for students of chemistry. 9. To know the atomic structure is to understand this phenomenon. 10. To give a short definition of a molecule is not so very easy. 11. To say that the density of a substance depends only on its mass and volume is to lose sight of the manner in which the molecules are packed together. 12. To obtain a spectrum is to pass a beam of white light through a spectrograph. 13. To make accurate measurements requires great care. 14. To start a reaction is one thing, but to keep it going on is another. 15. To imagine a molecule of water means to imagine a certain combination of hydrogen and oxygen atoms. 16. To think about ordinary conditions of a reaction means to think about room temperature and 1-atm pressure. 17. To speak about the properties of halogens is first of all to mention their extraordinary activity. 18. To compare the size of molecules is rather difficult.

B) 1. He was glad to have been travelling in Europe. 2. They can translate this text without a dictionary. 3. We want to translate this article. 4. I remember to have seen this man last year. 5. Can this work have been done in such a short time? 6. He must be reading a newspaper in the reading room. 7. He was made to stay in the laboratory and finish cleaning. 8. The obtained results led us to draw the following conclusion. 9. Under ordinary conditions it is not always easy to get some elements to combine with other elements. 10. They were forced to use an old apparatus because the new one was out of order. 11. Students who study chemistry must learn to do experiments.

C) 1. The motor is a device to change mechanical energy into electric energy. 2. The experiment to be carried on is described in this article. 3. I was the last to answer the teacher's question. 4. This is the device to be used in our experiment. 5. The thermometer is a device to measure the temperature. 6. Where are the articles to be translated by the students? 7. The letter to be answered was given to me. 8. Petroff was the first scientist to study electrification of metals by rubbing them. 9. We have a number of problems to solve. 10. The power station to be built here will supply this region with electric energy. 11. We have got one more problem to solve today. 12. This is the set of equations to be solved to understand the problem as a whole. 13. The amount of computations to be done is great. 14. The data to be analysed involve knowledge of numerical methods. 15. The methods to be

introduced are extremely useful for solving many practical problems. 16. This is the amount to be calculated. 17. This is the concept to be involved in our studies. 18. Pure and applied mathematics are the two branches to be studied in computational physics. 19. The motion to be calculated can be explained in terms of acceleration. 20. Professor N was the first to prepare this kind of glass electrodes in our laboratory. 21. They stayed at the laboratory till 8 in the evening, because they had a lot of work to do. 22. There are two points to discuss. 23. There are some rules never to be forgotten. 24. The need often arises in chemical research to measure the concentration of a solution with a high degree of precision. 25. A student to begin an experiment must get his supervisor's permission. 26. The substance to be dissolved is called the solute. 27. Acids are chemicals to be used carefully. 28. John Dalton was by no means the first to speculate about an atomic theory. 29. Lavoisier was the first to realize the importance of the balance for chemical investigation 30. Mendeleyev was the first Russian chemist to receive widespread recognition in the West during his lifetime. 31. The first element of the series of noble gases to be discovered was argon. 32. Oxygen is frequently chosen as one of the first elements to be studied in chemistry. 33. The capacity of a solvent to dissolve a given solute is often limited though there are many pairs of substances which can be mixed in any proportions.

D) 1. To understand the problem we must involve one new phenomena. 2. To answer this question we studied a great deal of publications on the problem. 3. We need a week more to study the problem in detail. 4. We have a strong evidence to predict this result. 5. Certain conditions must be observed to make nitrogen react with other elements. 6. In order to control our environment, the first purpose of science must be to study and understand it. 7. To answer the question "What are the uses of sulphuric acid?" fully, one would need to write a book. 8. The alkali metals are usually stored in oil so as to exclude air. 9. Sodium is a white metal soft enough to be easily cut with a knife and light enough to float on water. 10. The minerals in which aluminium occurs, are too numerous to recite. 11. If there were no order in the way in which atoms of different elements combine to form the molecules and crystals of compounds, it would be necessary to memorize one by one the formulas of thousands of substances.

INFINITIVE CONSTRUCTIONS - *ИНФИНИТИВНЫЕ ОБОРОТЫ*

I. Объектный инфинитивный оборот (*Objective Infinitive Construction - сложное дополнение*)

СТРУКТУРА: сочетание местоимения в объектном падеже или существительного в общем падеже с инфинитивом.

Подлежащее + сказуемое + **сущ. /мест-е (в объектн.падеже) + Инф-в**

инфинитивный оборот

	именит. падеж	объектн. падеж	именит. падеж	объектн. падеж
МЕСТОИМЕНИЯ В ОБЪЕКТНОМ ПАДЕЖЕ	I you he she it	me you him her it	We they	us them

e.g. We know [**him to be**] a good inventor. (Мы знаем, что он хороший изобретатель.)

ПЕРЕВОД: оборот переводится *дополнительным придаточным предложением* с союзами ***как***, ***что***, ***чтобы***. при этом местоимение (существительное) переводится подлежащим, а инфинитив – сказуемым.

e.g. We expect [***them to come***] in time. (*Мы ожидаем, **что** они придут вовремя*.)

Инфинитивный оборот употребляется после глаголов:

to believe *(полагать, считать)*	***to require*** *(требовать)*
to consider *(считать)*	***to show*** *(показывать)*
to expect *(ожидать)*	***to suppose*** *(полагать)*
to find *(находить, обнаруживать)*	***to think*** *(думать)*
to know *(знать)*	***to want*** *(хотеть)*
to prove *(доказывать)*	***to wish*** *(желать)*

Инфинитив в обороте употребляется без частицы ***to*** после следующих глаголов:

to feel *(чувствовать)*	***to notice*** *(замечать)*
to see *(вдеть)*	***to watch, to observe*** *(наблюдать)*
to hear *(слышать)*	***to make*** (*заставлять*)

e.g. I haven't heard [***anyone call***] me. (*Я не слышал, **чтобы** кто-нибудь меня звал*.)

II. Субъектный инфинитивный оборот (Subjective Infinitive Construction – Сложное подлежащее)

СТРУКТУРА: сочетание личного местоимения или существительного в именительном падеже и инфинитива, стоящего после сказуемого.

Подлежащее + вводящий глагол+ Инфинитив +второстеп. чл. предл.

инфинитивный оборот

e.g. This group is known to work in the lab.

ПЕРЕВОД: Сначала переводится вводящий глагол вводными словами или неопределенно-личным предложением (***говорят, как известно, как полагают, по-видимому***), затем союз ***что***, ***чтобы***, подлежащее и инфинитив – сказуемым.

e.g. **He** is said **to study** at the University. (*Говорят, **что** он учится в университете*.)
He is said **to have lived** in Washington. (*Говорят, **что** он жил в Вашингтоне*.)

Употребляется после:

1. следующих глаголов в ***PASSIVE VOICE***:

– **is/are said** – говорят
– **is/are stated** – сообщают
– **is/are reported** – сообщают
– **is/are believed** – полагают, считают
– **is/are supposed** – предполагают
– **is/are thought** – думают, считают
– **is/are expected** – ожидают
– **is/are known** – известно
– **is/are considered** – считают

e.g. **They** are expected **to come back** in two days. (*Ожидают, **что** они вернутся через 2 дня*.)

2. следующих глаголов в ***ACTIVE VOICE***:

– **seem(s)** – кажется, по-видимому
– **appear(s)** – кажется, по-видимому
– **prove(s)** – оказывается
– **happen(s)** – случается
– **turn(s) out** – оказывается

e.g. **They** seemed **to have forgotten** this problem already. (*Казалось, **что** они уже забыли эту проблему*.)

3. фраз:

– **is/are likely** – вероятно
– **is/are unlikely** – маловероятно
– **is/are certain** – несомненно
– **is/are sure** – верно, наверняка

e.g. **They** are unlikely **to come** in time. (*Маловероятно, **что** они приедут вовремя*.)

III. The for-to Infinitive Construction (*Инфинитивная конструкция с предлогом **for***)

СТРУКТУРА: **for + местоимение + Infinitive (существительное)**

МОДЕЛЬ: «ЧТОБЫ КТО-ТО СДЕЛАЛ ЧТО-ТО»

В этом обороте **for** переводится «**чтобы**», инфинитив – сказуемым.

e.g. **[<u>For the people to work</u>]** better they should be interested in their work. (***Чтобы*** *люди работали лучше, они должны быть заинтересованы в работе*.)

Ex. 39. Переведите предложения на русский язык, обращая внимание на инфинитивные обороты:

A) **SUBJECTIVE INFINITIVE CONSTRUCTION**

1. Light and radio waves are said to be of similar nature. 2. First sputniks are known to have led the way into space for man. 3. The neutrons and protons of an atom are known to be linked together to form a compact nucleus. 4. Many proteins were found to be mixtures of several chemical compounds. 5. Carbon steel has been known to be the principal product of the steel industry. 6. The laser beam seems to have almost unlimited industrial possibilities. 7. These chemical changes appear to have been caused by heat. 8. The capacity of this aggregate proves to be increasing by and by from its starting. 9. This new approach to the problem discussed appears to be the most satisfactory. 10. Mobile atomic power stations are certain to be developed and maintained in our country. 11. These experiments are likely to have been made in suitable conditions. 12. The discovery of a laser is sure to be of great value. 13. The application of this device is unlikely to give better results. 14. Light is proved to travel in straight lines. 15. Light intensity proves to be measurable. 16. The speed of light in free space is proved to be a measured constant. 17. This property appears to have been mentioned frequently in the past. 18. They are likely to be familiar with this phenomenon. 19. Heat is known to be a form of energy. 20. This scientist is said to have been working on the problem of splitting atoms. 21. Coal is considered to be a valuable fuel. 22. The electrolytes are known to change greatly when the current flows through them. 23. Copper and silver are considered to be the best conductors of electricity. 24. Many oxides are found to combine with acids to form salts and water. 25. Once the validity of a hypothesis has been tested by all possible experiments and is found to be in harmony with all the facts, it assumes the status of a theory. 26. The discovery of silicon was an important event in chemistry, for the properties of the element were found to be very close to those predicted by D. I. Mendeleyev on the basis of his periodic law.

B) **OBJECTIVE INFINITIVE CONSTRUCTION**

1. We know this scientist to have been working at this problem for some years. 2. The chemist expected his assistant to obtain a new substance with some new properties. 3. I'd like this reaction to be repeated. 4. We can make an atom serve the needs of man. 5. They found the gas to be oxygen. 6. This scientist states laser light to be different from ordinary light. 7. The scientists proved this substance to be an element. 8. The visitors saw the skilled worker assemble the tiny devices very quickly. 9. Specialists believe engineers to utilize synthetic fibres for various purposes. 10. We expect this scientist to be working at this scientific problem. 11. We know this young man to work in the field of quantum generators. 12. The engineer wants the new methods to be used in the production process. 13.

Specialists believe synthetic fibres to be widely utilized in different industries. 14. We know him to have worked out a new method of applying quantum generators in medicine.

C) The for-to Infinitive Construction

1. For uranium minerals to be used in industry is not a usual thing. 2. For atoms to have the same chemical properties is to be the atoms of one element. 3. For molecules to have the same composition implies the existence of the same structure. 4. For compounds to be bonded by a covalent bond implies having one or more shared electron pairs. 5. We waited for the solution to boil. 6. This is the condition for everybody to observe. 7. It often happens that the necessary condition for the reaction to begin is the presence of a catalyst. 8. There are a lot of problems for chemists to solve. 9. The rise of temperature gives more opportunity for the molecules to react. 10. In order for two molecules to react with each other, they must, first of all, be in the presence of each other. 11. For hydrogen to be obtained from water, electrolysis may be used.

Ex. 40. Переведите предложения на русский язык, обращая внимание на инфинитивные обороты.

A) 1. Bromine happened to be prepared in 1826. 2. The hypothesis is likely to be confirmed soon. 3. An atom was considered by the ancients to be an indivisible particle. 4. The approach is sure to attract the attention of the scientists. 5. These new results are likely to be widely discussed. 6. At first the discovery did not seem to be very important. 7. The experiment is not likely to be finished at 5. 8. Calculations are said to have confirmed this idea. 9. Fundamental particles are regarded to be indivisible. 10. The atom has long been believed to be a simple particle. 11. Nobody was supposed to be informed about the observed phenomenon. 12. The reaction is supposed to give a good yield. 13. The library is reported to have got many foreign journals this month. 14. The symposium was heard to be a great success. 15. The composition of membranes was expected to be described in the next chapter. 16. Their laboratory was known to have been investigating the properties of electrodes for some ten years. 17. Sulphur might be expected to occur in a number of different forms. 18. A reaction may be shown to occur under ordinary conditions. 19. Chemical industry may be said to have begun in the 19th century. 20. Mendeleyev is known to have been born in Tobolsk. 21. Dalton's hypothesis was later proved to be true. 22. Fundamental particles are no longer considered to be non-existent. 23. Radioactivity is known to be affected by the presence of other elements which are not radioactive. 24. Air was later found not to be an element. 25. Hydrogen does not appear to react quickly with chlorine in the dark. 26. Pure liquid HCl does not seem to be conductor of electricity. 27. Under certain conditions an atom of hydrogen may be regarded to be acting as a bond. 28. There appears to be no difficulty in determining the rate of this reaction. 29. There seems to be no evidence in favour of your idea. 30. The phenomenon has never been observed to occur under ordinary conditions. 31. Chlorine is stated to

have been discovered in 1774. 32. Solid carbon is usually said to exist in three modifications.

B) 1. Everybody considers him to be an expert in his field. 2. Mendeleyev believed some elements to be missing in his periodic table and he even predicted their properties. 3. The teacher expected us to finish the work at 5, but we couldn't solve the problem. 4. I suppose the paper to have been already typed. 5. They saw him pour the liquid into the test-tube and then heat the tube over the burner. 6. She heard somebody call her and went to the door. 7. Experiments sometimes permit some useful information about the chemical bond to be obtained. 8. I knew him to have passed the exam in mathematics successfully, that is why I asked him to help me. 9. We should expect the atomic weight of sulphur to be greater than that of oxygen. 10. The ancient scientists believed earth, water, air and fire to be elements. 11. Dalton thought a water molecule to consist of one hydrogen and one oxygen atom. 12. Sometimes, the presence of the catalyst causes the two elements to unite and form a compound. 13. Dr. N thought high stability of the compound to be due to the presence of an admixture ions. 14. Let's assume the volume of the gas to be equal to *x*. 15. Pressure causes gas to compress. 16. Qualitative analysis enables the composition of a sample to be determined. 17. Mendeleyev's periodic table allows the suppositions about the atomic structure to be made.

Тема 8
ТЕМА: СЛОЖНОЕ ПРЕДЛОЖЕНИЕ

СЛОЖНОСОЧИНЕННЫЕ ПРЕДЛОЖЕНИЯ

Простое предложение	**союз/,**	Простое предложение

Простые предложения в составе сложносочиненных связываются с помощью сочинительных союзов:

and – и, а

but – но

or – или

either … or … - или … или …

neither … nor … - ни … ни …

not only … but (also) … - не только …. но и ….

both … and … - как …, так и …; и … и …

as well as – а также, также как и

e.g. One form of energy can be transformed into another, ***but*** it can be neither created nor destroyed. (*Один вид энергии можно превратить в другой,* ***но*** *ее нельзя ни создать, ни уничтожить.*)

СЛОЖНОПОДЧИНЕННЫЕ ПРЕДЛОЖЕНИЯ

Придаточные предложения в составе сложно-подчиненного предложения могут присоединяться к главному при помощи слов:

1. ***that*** – что, который	13. ***before*** – прежде чем, до того как
2. ***who*** – кто	14. ***as*** – так как, когда, в то время как
3. ***whose*** – чей	15. ***till*** – пока, до тех пор пока
4. ***what*** – что, какой	16. ***until*** – пока не, до тех пор пока не
5. ***which*** – который	17. ***since*** – с тех пор как, поскольку
6. ***when*** – когда	18. ***because*** – потому что
7. ***where*** – где, куда	19. ***though, although*** – хотя
8. ***how*** – как	20. ***if*** – если
9. ***why*** – почему	21. ***unless*** – если только не
10. ***whenever*** – всякий раз когда	22. ***provided (that)*** – при условии что
11. ***while*** – в то время как, когда, пока	***in order that, so that*** – чтобы, для того чтобы
12. ***after*** – после того как	

Придаточные предложения отвечают на те же вопросы, что и члены простого предложения, и являются более распространенными. Поэтому существует столько же видов придаточных предложений, сколько и членов предложения.

Типы придаточных предложений	
1. **Придаточное-подлежащее**	***e.g.*** **What you say** is interesting. (*То, что вы говорите, интересно*.) **That water is a good conductor of sound** is a well-known fact. (*То, что вода хороший проводник звука, хорошо известный факт*.)
2. **Дополнительное придаточное**	***e.g.*** He told them **what he had seen there**. (*Он рассказал им, что он увидел там*.) Experiments show us **that there is very little attraction between the molecules of the gas**. (*Опыты показывают нам, что между молекулами газа существует очень малое притяжение*.)
3. **Определительное придаточное**	***e.g.*** These waves **which are commonly called radio waves** travel with the velocity of light. (*Эти волны, которые называются радиоволнами, распространяются со скоростью света*.)
4. **Обстоятельственное придаточное**	***e.g.*** I saw him **when I was in the lab**. (*Я видел его, когда бы в лаборатории*.)

ПРИМЕР

The foundations of dynamics were laid at the end of the 16th century by Galileo Galilei who, by experimenting with a smooth ball rolling down an inclined plane, derived the law of motion for falling bodies, and he was also the first to recognize that force is the cause of changes in the velocity of a body.

СЛОЖНЫЕ ПРЕДЛОЖЕНИЯ С "whether" ("ли")

Перевод: Сначала найти сказуемое, затем добавить к нему частицу "***ли***", остальное – по порядку.

e.g. The problem was ***whether*** substances combine in definite proportions.
Whether this synthesis will take place is unknown.

Функции *that*

1) **УКАЗАТЕЛЬНОЕ МЕСТОИМЕНИЕ** (ед. ч. – ***that***; мн. ч. – ***those***)

Функции в предложении:	
1. ***Подлежащее***. Переводится на русский язык "**это**"	***e.g.*** **That** is a colourless solution. (**Это** бесцветный раствор.)

2. ***Определение*** к сущ. Переводится на русский язык "**этот, тот**".	***e.g.*** The boiling point of **that** liquid is 25ºC. (*Точка кипения **той** жидкости 25ºС*.)
3. ***Заменяет ранее упомянутое существительное*** в единственном числе (во множ. числе – ***those***). На русский язык переводится **тем существительным, которое заменяет**.	***e.g.*** The reaction opposite to **that** of oxidation is reduction. (*Реакция противоположная **реакции** окисления является восстановлением*.)

2) **СОЮЗ** – вводит различные придаточные предложения: Способы перевода:

1) ***придаточное подлежащее***, которое стоит в начале предложения перед или после сказуемого главного предложения. Переводится "**что; то, что**"	***e.g.*** ***That*** solids can expand was proved by experiments. (***То, что*** *твердые тела могут расширяться, было доказано опытами*.)
2) ***придаточное сказуемое***, которое стоит после глагола-связки be. Например, … **is that** … переводится "**состоит в том, что; заключается в том, что**".	***e.g.*** One of the properties of liquid ***is that*** it can expand. (*Одно из свойств жидкости **заключается в том, что** она может расширяться*.)
3) ***придаточное дополнительное***, которое стоит после сказуемого главного предложения. Переводится "**что**".	***e.g.*** He knows ***that*** chemistry is a very important science. (*Он знает, **что** химия – очень важная наука*.)
4) ***определительное придаточное предложение***. **That** стоит после определяемого слова. Переводится "**который**"	***e.g.*** A barometer is an instrument ***that*** measures air pressure. (*Барометр – это прибор, **который** измеряет давление воздуха*.)
5) ***придаточное предложение цели***. Иногда этот союз сочетается со словами **so (that)** и **in order (that)**. Переводится "**чтобы; так что; для того, чтобы**"	***e.g.*** Some liquids will increase in volume greatly when heated, ***so that*** liquids expand more than solids. (*Некоторые жидкости будут значительно увеличиваться в объеме при нагревании, **так что** жидкости расширяются больше чем твердые тела*.)

3) **УСИЛИТЕЛЬНЫЕ КОНСТРУКЦИИ**:

1) **It is (was) … that …** . Выделяемый член предложения ставится между глаголом-связкой (*is, was*) и союзом (*that*). При переводе перед выделяемым членом предложения необходимо поставить слово "***ИМЕННО***", а союз ***that*** и местоимение ***it*** на русский **не переводить**.

e.g. **It is** iron **that** is one of the most important metals. (***Именно*** *железо является одним из самых важных металлов*.)

2) Конструкция **It is (was) not until (till) … that …** переводится предложением в утвердительной форме со словами "**только; только тогда, когда**". **That** на русский язык **не переводится**.

e.g. **It was not until** 1990 **that** this investigation was published. (*Это исследование было опубликовано* ***только*** *в 1990 году*.)

БЕССОЮЗНЫЕ СЛОЖНЫЕ ПРЕДЛОЖЕНИЯ

1) Бессоюзное подчинение в определительных придаточных предложениях

В английском языке в определительных придаточных предложениях союзы ***who***, ***which***, ***that*** могут быть пропущены.

Схема. существительное + существительное + глагол
существительное + местоимение + глагол

придаточное предложение

Правило. Если в предложении за двумя рядом стоящими существительными или существительным и местоимением употреблен глагол в личной форме, то второе существительное или местоимение обычно является подлежащим *определительного придаточного предложения*, которое присоединено к главному без союза. На стыке двух существительных или существительного и местоимения пропускается союз (*who, which, that*).

!!! Такие придаточные предложения на русский язык переводятся определительными придаточными предложениями с союзом "**КОТОРЫЙ**".

e.g. The **device** ⇩ **we** have just used **|** is very effective. (*Оборудование,* ***КОТОРОЕ*** *мы только что использовали, очень эффективное*.)

e.g. Every **substance** ⇩ **the chemist** uses **|** **consists** of molecules. (*Каждое вещество,* ***КОТОРОЕ*** *использует химик, состоит из молекул*.)

Правило. Если в конце определительного придаточного предложения, присоединенного к главному без союза, есть ***ПРЕДЛОГ***, то он относится к подразумеваемому союзу.

e.g. Give me the **book** ⇩**you** are speaking ***about***. (*Дайте мне книгу,* ***О КОТОРОЙ*** *Вы говорите*.)

2) Бессоюзное подчинение в дополнительных придаточных предложениях

В английском языке иногда в дополнительных придаточных предложениях союз ***that (что)*** может быть пропущен.

Правило. Если за глаголом следует существительное без предлога (или местоимение), после которого употреблен глагол в личной форме, это существительное является подлежащим *дополнительного придаточного предложения*, которое присоединяется к главному без союза.

!!! Такие придаточные предложения на русский язык переводятся с союзом "**ЧТО**".

e.g. I think ⇩ **the substance** will be ready by tomorrow. (*Я думаю, **что** вещество будет готово к завтрашнему дню*.)

e.g. We know ⇩ **chemistry** is very important. (*Мы знаем, **что** химия очень важна*.)

CONDITIONAL SENTENCES

Условные предложения

Условные предложения вводятся союзами ***if*** (***если***),
unless (***если не***),
provided (***при условии если***).

Существует 3 типа условных предложений.

I тип – выражает ***реальное*** условие, переводится ***будущим*** временем.

Future Indefinite **shall / will + глагол**	***if*** +	Present Indefinite
главное предложение		придаточное условное предложение

e.g. Water *will not boil* ***UNLESS*** we *heat* it to 100ºC. (*Вода не закипит, если мы не нагреем ее до 100ºС*.)

II тип – выражает ***маловероятное*** условие, относится как к ***настоящему***, так и к ***будущему*** времени.
Переводится ***прошедшим*** временем с частицей "***бы***" (т.е. *сослагательным наклонением*).

Future Indefinite-in-the-Past **should / would + глагол**	***if*** +	Past Indefinite **2-ая форма глагола (*V-ed*)**
главное предложение		придаточное условное предложение

e.g. IF the temperature *were raised*, the evaporation *would be accelerated*. (*Если бы температуру повысили, то ускорили бы выпаривание*.)

NOTE! Глагол ***to be*** в придаточном предложении имеет форму ***were*** для всех лиц.

e.g. If he ***were*** here, I would tell him about it. (*Если бы он был здесь, я бы сказал ему об этом.*)

III тип – выражает ***нереальное*** условие, относится к ***прошедшему*** времени. Переводится ***прошедшим*** временем с частицей "***бы***".

Future Perfect-in-the-Past	***if*** +	Past Perfect
should / would + have + 3 ф. гл.		**had + 3 ф. гл.**
главное предложение		придаточное условное предложение

e.g. If I *had translated* the article yesterday, I *would have got* a good mark. (*Если бы я перевел статью вчера, я бы получил хорошую оценку.*)

NOTE! В ***III типе*** союз ***if*** иногда пропускают, в этом случае изменяется порядок слов. Глаголы ***had***, ***were***, ***could***, ***should*** (*в значении долженствования*) выносятся перед подлежащим.

e.g. Could a substance be cooled to -273º, the molecules would be motionless. (*Если бы вещество можно было охладить до -273º, молекулы были бы неподвижны.*)

Ex. 41. Переведите предложения на русский язык, обращая внимание на функции "THAT (THOSE)".

A) 1. Put your bag on that table. 2. Mendeleyev found that the atomic weights were correlated with the properties of corresponding elements. 3. The atomic weight of potassium is 39.098 and that of argon is 39.948. 4. The inversion of the order in the periodic system from that of atomic weight caused much concern. 5. The properties of the elements and those of their compounds are close to those predicted by Mendeleyev. 6. That difficulty exists no more. 7. The properties of those compounds are different. 8. Elements from Group I differ from those of Group II.

B) 1. The concentration of iodine in the ether layer is approximately 200 times that of the water layer. 2. We know that in all chemical reactions the weight of the substances that are reacting is equal to the weight of the products obtained. No one has ever observed this phenomenon. 3. A gram molecular weight of a gas is that weight which occupies the same volume as 32-grams of oxygen at the same temperature and pressure. 4. This method is simpler than that one. 5. A rise in temperature increases the velocity of the endothermic reaction more than that of the exothermic reaction. 6. It is the analytical chemistry that is regarded as the oldest field of chemistry. 7. One may expect that this substance dissolves easily in water. 8. The number of molecules of water is twice that of molecules of oxygen from which it is produced, that is each oxygen molecule is split into two equal

reactive units. 9. The density of ice is lower than that of liquid. 10. In terms of crystal structure, isomorphism means that isomorphous substances form crystals with identical space-lattices, and that units of one compound may replace those of another. 11. It should be mentioned that metals in solid state are invariably crystalline. 12. It is horizontal rows of the periodic table which are called periods. 13. One should take into account that sulphides of many metals are used in paint industry. 14. Compounds that contain an ionic bond dissolve in water to form solutions. 15. Our new atomic stations are more powerful than the old ones. 16. The conduction of an electric current by a solution differs from that of an electric current by a metal. 17. The freezing points of nonpolar substances are usually much lower than those of either ionic or polar substances. 18. Gases have no specific volume or shape but take the volume and shape of the vessel that contains them. 19. Such a process is typical for the phenomenon known as vaporization, that is the phenomenon, in which numbers of molecules escape from the liquid and enter the vapour or gaseous state. 20. In liquids the force of attraction between the molecules is less than that in solids. 21. That this liquid can be evaporated to dryness there is no doubt. 22. One of the greatest problems of our era is that of outer space. 23. Now we know that all substances consist of atoms. 24. The properties of metals are different from those of wood. 25. It is not until two pieces of zinc and copper are brought into contact that they become electrified. 26. That water is a compound was proved at the end of the 18th century. 27. The decision of the commission was that the discovery was of great importance to industry. 28. The distance that light travels in one second is 300 thousand kilometres. 29. The melting point of titanium is 2,000° above that of aluminium. 30. Some properties of air are similar to those of water. 31. We know that air has pressure. 32. The production of ozone requires that a large quantity of energy be absorbed. 33. It is the law of conservation of mass that makes possible the writing of chemical equation. 34. The amount of heat liberated by slow oxidation is the same as that liberated by rapid combustion.

Ex. 42. Переведите предложения на русский язык.

1. It is the analytical chemistry that is regarded as the oldest field of chemistry. 2. It is M. V. Lomonosov who is the founder of Russian physics and chemistry. 3. It was my supervisor who advised me to use this apparatus. 4. It was Mendeleyev's periodic law which served as a key to discovering new elements. 5. It was evident that the resulting mixture did obey the mixture law. 6. It was in 1869 that Mendeleyev's periodic system was published. 7. It is not until a substance undergoes distribution that it has the same molecular weight in the two phases. 8. It was not until oxygen was discovered that many processes could be understood. 9. It is not this examination that is the most difficult this term. 10. It was not till late in the 19th century that numerous household items began to be produced at factories. 11. It is not until two pieces of zinc and copper are brought into contact that they become electrified. 12. It is only at ordinary temperature that the agreement between the two methods is satisfactory. 13. It was not until the results concerning solid solutions had been obtained that a general conclusion was reached. 14. It was

my colleague who recommended that the pressure of the reacting substances should be increased.

Ex. 43. Переведите предложения на русский язык.

A) 1. Who is the discoverer of the periodic law is well known not only to specialists but practically to everybody. 2. That solid, liquid and gas are the three main states of a substance is a matter of common knowledge. 3. Whether these substances will react depends on the conditions of the reaction. 4. Whether a solution is acidic or not may be easily shown using litmus paper. 5. That a particular substance contains one element or another may be determined by qualitative analysis. 6. What pressure should be applied should be decided before the experiment. 7. Whether water is a compound or not may be shown by the reaction between water and some metals. 8. What ancient scientists thought was based on what they could observe around them. 9. That the alchemical period was very important in the history of chemistry is unquestionable. 10. That chain molecules can be many thousands of atoms in length affects the behaviour of these substances. 11. When the process started was not registered by the instrument. 12. That water will dissolve a great number of different substances is an interesting fact. 13. That at the early stages of its development chemistry was mostly descriptive in character was quite natural. 14. Who the discoverer of nitrogen was is well known, it was isolated by Rutherford. 15. That students of chemistry should be able to write chemical equations accurately is highly important. 16. That it was A. M. Butlerov who introduced the term "chemical structure" should not be forgotten. 17. That melting is a physical process must be quite clear to the student of chemistry. 18. Whether the hydrogen bond will be broken depends on the amount of energy. 19. Who will examine us in general chemistry is not known yet.

B) 1. He says he works in the laboratory of organic chemistry. 2. He said he would go to Moscow next week. 3. She said she would be working in the library at 3 o'clock. 4. Every student knows he must be careful when he works in the laboratory. 5. One can say pure oxygen is a colourless, odourless and tasteless gas. 6. There is no doubt that chemistry is of great service to medicine. 7. They have just read how oxygen was produced. 8. The laboratory assistant showed us where the chemicals were stored. 9. We don't know whether the library is open now. 10. She told us that she had been present at the seminar and could show us her notes. 11. Everybody knew that Dr. N had been working on the subject for a long time before making his report at the conference. 12. We thought we should have done our experiment by that time. 13. Sometimes it is difficult to decide what term should be used, because there is no uniformity in the nomenclature. 14. I asked her whether she had finished the exercise. 15. It is not known how and when glass was first obtained. 16. It is often necessary to determine if any particular substance is a mixture or a solution. 17. Every chemist knows that it was in 1869 that Mendeleyev's article on the periodic system was published. 18. Mendeleyev's law stated that the properties of elements are periodic functions of their atomic weights. 19. It is absolutely necessary that we should know what substances we are going to

obtain in a reaction. 20. Temperature does not depend on how much matter is present. 21. It is necessary that the temperature should be kept constant. 22. The supervisor insisted that we should learn the instruction. 23. Much depends on what the conditions of a reaction are. 24. It is essential that oxidation state should be known. 25. Our supervisor proposed that we should write a joint paper. 26. The teacher advised that the student should consult a reference-book. 27. It was necessary to prove whether the conclusion that was made in the paper was right.

C) 1. As the temperature is raised, the rate of evaporation increases. 2. Whenever a chemical reaction occurs, an energy change takes place. 3. Liquid bromine should be kept in well-stopped bottles, as this element is poisonous. 4. Where the current enters or leaves the liquid, there are evidences of chemical action having taken place. 5. Carbon monoxide cannot properly be described as either a basic or an acidic oxide, inasmuch as it does not react with water. 6. Physics and chemistry are so closely related that textbooks of these two subjects contain much in common. 7. Important as the problem of solubility may be, we shall not consider it now. 8. Let us consider any factors lest anything may be omitted. 9. When carbon forms bonds to atoms other than hydrogen, such as oxygen, nitrogen, and sulfur, the structural possibilities become even greater.

D) 1. If air were a single compound, it would have a definite composition by weight. 2. If you take a sample of the solution from any point in the solution, the proportions of the materials will be the same. 3. Were this laboratory equipped well, it would be much easier to work in it. 4. If a tin or iron vessel were cooled by liquid air it would become very brittle. 5. If a large piece of this metal is put into some water, the heat of the reaction will cause the metal to melt. 6. If the number of covalent bonds to an atom is greater than its normal valence it will carry a positive charge. 7. Unless the electron microscope had been used, it would not have been possible to obtain these results. 8. If the bonding electron pair moves away from the hydrogen nucleus, the proton will be more easily transferred to a base. 9. If arsenic were added to pure germanium, the conductivity of the latter would increase. 10. If a cation carries a charge of +1, then it is monovalent. 11. Had the mixture been heated, the change of colour would have started sooner. 12. If two carbon atoms are joined together, with three hydrogen atoms bonded to each carbon atom, the molecule of ethane is obtained. 13. Had they known about this new discovery earlier, they would have applied the method in their investigation. 14. If the density of a substance and either mass or volume is known, volume or mass can be calculated. 15. If it is assumed that in water one atom of hydrogen is combined with one atom of oxygen, the atomic weight of oxygen will be equal to 8. 16. If a gas were colourless, we would not notice its formation. 17. Had he weighed these substances, he would have noticed the differences in weights. 18. If liquid air were boiled, nitrogen would escape from the solution more rapidly than oxygen. 19. Calcium carbonate would have gradually decomposed had it been heated a longer time. 20. If a substance passed from the solid state directly to the vapour state, this change would be called sublimation. 21. If we determine the

boiling point of each solution and then proceed to subtract the boiling point of pure water we will get a boiling point difference. 22. A glass of water would become coloured were a drop of ink added to it. 23. If sulphur trioxide is thrown into water, it will dissolve with the evolution of much heat. 24. If we had chosen the second oxide, the valence of sulphur and, therefore, its equivalent weight would have been different. 25. Fluorine and hydrogen combine violently even in the dark, provided a trace of moisture is present. 27. Were the parameters maintained, the reaction would go to completion. 28. Unless the electron microscope had been used, it would not have been possible to obtain these results. 29. Were the parameters maintained, the reaction would go to completion.

E) 1. Aluminum is the most abundant metal in the Earth's crust, although it is not found free in nature.2. Molecules are defined as independent or relatively independent particles which consist of at least two atoms. 3. The energy decreases, until the nuclei approach so closely that they begin to repel each other. 4. Many ordinary objects we use in our every-day life would not be available without chemistry. 5. It was known that proteins were composed of amino acids. 6. Although these distinct compounds all have the same molecular formula, only one can be called hexane. 7. Some molecules can exist as optical isomers even though they do not have an asymmetric centre. 8. The number of atoms which are typically bonded to a given atom is called the valence of that atom. 9. Since a compound contains two or more different elements, it also contains two or more different atoms. 10. We know electricity produces heat. 11. Large molecules have more electrons and nuclei that create attractive forces.

ПОВТОРЕНИЕ

Ex. 44. Переведите текст на русский язык, обращая внимание на все, изученные ранее, грамматические явления.

SOLUBILITY

While there are many pairs of substances which, like water and ethyl alcohol, can be mixed in any proportions to form homogeneous solutions, it is a matter of common experience that the capacity of a solvent to dissolve a given solute is often limited. When a solvent placed in contact with an excess of solute attains and maintains a constant concentration of solute, the solute and solution are at equilibrium, and the solution is said to be saturated. The solubility of a substance in a particular solvent at a given temperature is the concentration of the solute in the saturated solution. In other words, the solubility of a solute is the dissolved concentration characteristic of the state of equilibrium between the solute and the solution. It is difficult to overemphasize the importance of the concept of solubility to chemistry; it is the basis of innumerable laboratory and industrial processes that prepare, separate, and purify chemicals, and is the controlling factor in a variety of geological and other natural phenomena. The solubility of a substance in a particular solvent is controlled principally by the nature of the solvent and solute themselves, but also by the conditions of temperature and pressure. To analyse these factors, we shall first limit ourselves to the case of ideal solutions.

The liquids that form an ideal solution are always miscible in any proportions and, thus, have infinite solubility in each other. The reason for this is easy to see if we recall two facts. First, limited solubility and a saturated solution result only when a solute and its solution reach equilibrium. Second, the equilibrium state is a compromise between a natural tendency toward minimum energy and maximum molecular chaos. Now, the mixing of two ideal liquids is always accompanied by an increase in entropy or molecular chaos, because in the solution, the solute molecules are spread randomly throughout the solvent, rather than being nearly closest packed as they are in the pure solute. That is, even if we could locate one solute molecule in solution, we could not predict what the identity of its nearest neighbours was, as we could, if the molecule were in the pure solute phase. Consequently, the solution has a higher entropy than the pure solvent and solute, and the tendency to-ward maximum molecular chaos favours the mixing of the two liquids. Moreover, the fact that there is no energy change in the mixing process means that the tendency toward minimum energy does not restrict the solution process. Consequently, the two liquid components of an ideal solution can mix in any proportion.

ПРИЛОЖЕНИЕ
СЛУЖЕБНЫЕ СЛОВА

Местоимения и наречия	
all	все
almost	почти
also	также
always	всегда
another-other	другой-другие
any	любой
every-each	каждый-каждый
few-little	немногие-немногое
just	как раз
least	наименьший
less	менее
many-much	многие-многое
more	более
most	наибольший
no	никакой
only	только
the only	единственный
some	некоторый
the same	тот же самый
such	такой
that - those	тот-те
this - these	этот-эти
very	очень
the very	тот же самый
yet, still	еще

Союзы	
after	после того, как
and	и, а
as	так как, когда
as … as	так(ой) же … как и
as long as	до тех пор пока
as soon as	как только
as well	так же
as well as	так же как и
because	потому что
because of	из-за
before	перед тем, как
both	оба, пара
both… and…	как … так и …
but	но
either… or …	или … или …
for	так как

how	как
how many (how much)	сколько
however	однако
if	если
nether … nor …	ни … ни …
or	или
provided	если, при условии если
since	так как, с тех пор как
so	так, так что
so as	так, чтобы
than	чем (*сравнение*)
rather than	а не
that	что, который
then	тогда, затем
though (although)	хотя
thus	таким образом
till	до тех пока, до
unless	если не
until	до тех пор пока не
what	что, какой
when	когда
where	где
whereas	в то время, когда
whether	ли
which	который
while	в то время, когда
who	кто, который
whose	чей
why	почему

Предлоги	
about	около, о
above	над
across	поперек
after	после
against	против
along	вдоль
among	среди
around	вокруг
as	как
at	у
because of	из-за
before	перед
behind	позади
below	ниже
between	между

by	(*отвечает на вопрос* чем?)
down	вниз
during	в течение
for	для, в течение
from	из, от
in	в
into	внутрь
near	вблизи
off	от
on (upon)	на
out of	изнутри
over	сверху
since	с
through	через
throughout	через все
till (until)	до
to	к
toward	по направлению
under	под
up	вверх
with	с
within	в рамках
without	без

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