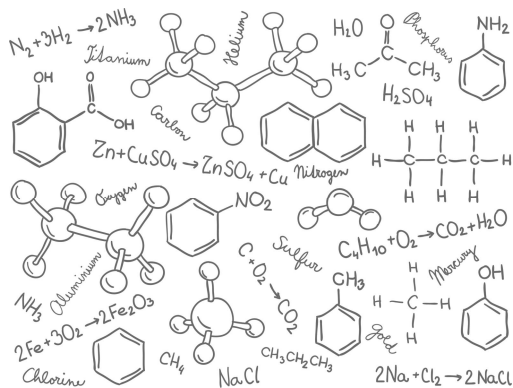


В.В. Ганина, В.А. Киясь

КОНТРОЛЬНЫЕ ЗАДАНИЯ
ПО ГРАММАТИКЕ АНГЛИЙСКОГО ЯЗЫКА
ДЛЯ СТУДЕНТОВ-БАКАЛАВРОВ 2 КУРСА И
СТУДЕНТОВ-МАГИСТРАНТОВ
ХИМИКО-ТЕХНОЛОГИЧЕСКИХ
СПЕЦИАЛЬНОСТЕЙ

Учебное пособие



Иваново
2017

Министерство образования и науки Российской Федерации
Ивановский государственный химико-технологический университет

В. В. Ганина, В.А. Киясь

КОНТРОЛЬНЫЕ ЗАДАНИЯ
ПО ГРАММАТИКЕ АНГЛИЙСКОГО ЯЗЫКА
ДЛЯ СТУДЕНТОВ-БАКАЛАВРОВ 2 КУРСА
И СТУДЕНТОВ-МАГИСТРАНТОВ
ХИМИКО-ТЕХНОЛОГИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ

УЧЕБНОЕ ПОСОБИЕ

Иваново 2017

УДК 546-547

Ганина, В. В. Контрольные задания по грамматике английского языка для студентов-бакалавров 2 курса и студентов-магистрантов химико-технологических специальностей: учеб. пособие / В.В.Ганина, В.А. Киясь; Иван. гос. хим.-технол. ун-т.- Иваново, 2017. - 80 с.

Учебное пособие состоит из двух основных разделов.

Первый раздел посвящен краткому и наглядному изложению грамматики английского языка по следующим темам: функции местоимений *it, one, that*; функции глагола *would*, условные предложения и различные виды придаточных предложений; инфинитив и инфинитивные конструкции.

Второй раздел включает три комплекта контрольных работ разного уровня: минимального (варианты 1-5), базового (варианты 6-10) и продвинутого (варианты 11-15). Проверочные работы используются для промежуточного и итогового контроля. Наличие 15 вариантов в каждой контрольной работе дает возможность часть из них использовать при подготовке к написанию работы, а также позволяет применить принципы дифференциации и индивидуализации обучения. Лексическое наполнение контрольных работ профессионально ориентировано, материал подобран из современных аутентичных англоязычных текстов.

Предназначено для комплексной проверки лексико-грамматических навыков чтения и перевода. Рекомендуются для студентов-бакалавров II курса и студентов-магистрантов химико-технологических специальностей.

Печатается по решению редакционно-издательского совета Ивановского государственного химико-технологического университета.

Рецензенты:

доктор филологических наук, профессор Ф.И. Карташкова (Ивановский государственный университет); кандидат филологических наук Т.А. Таганова (Ивановский государственный университет)

© Ганина В.В., Киясь В.А., 2017
© ФГБОУ ВО «Ивановский государственный химико-технологический университет», 2017

CONTENTS

I. Part I

Grammar.....	4
--------------	---

II. Part II

1. Test I. It, one, that.....	22
2. Test II. Would, Conditional Sentences, Subordinate Clauses.....	41
3. Test III. Infinitive and Infinitive Constructions.....	60

PART I
GRAMMAR

I. IT, ONE, THAT

Functions of It

Функция	Перевод	Примеры
Указательное местоимение	Переводится словом «это».	<i>It is methane.</i> – Это метан.
Личное местоимение	Переводится «он, она, оно» в зависимости от рода неодушевленного существительного в русском языке в качестве подлежащего в предложении.	<i>Aluminium is a metal. It is light.</i> Алюминий – металл. Он легкий.
	Переводится «его, ее, ему, ей» в зависимости от рода неодушевленного существительного в русском языке в качестве дополнения в предложении.	<i>Chemistry is a very interesting subject.</i> <i>We study it.</i> Химия – очень интересный предмет. Мы изучаем ее.

<p>Формальное подлежащее</p>	<p>Не переводится:</p> <p>1) при сообщениях о явлениях природы, при обозначении времени и расстояния;</p> <p>2) с глаголами: <i>to seem</i> – казаться; <i>to chance</i> – случаться; <i>to happen</i> – случаться; <i>to turn out</i> – оказываться; <i>to appear</i> – казаться;</p> <p>3) при наличии в предложении логического подлежащего, выраженного инфинитивом, герундиальным оборотом или придаточным предложением, которые стоят после именного сказуемого;</p> <p>4) при смысловом выделении какого-либо члена предложения употребляется следующий оборот</p>	<p><i>It is 5 o'clock.</i> 5 часов.</p> <p><i>It seems that iron is one of the most important metals.</i> Кажется, железо – один из самых важных металлов.</p> <p><i>It is never too late to learn.</i> Учиться никогда не поздно.</p> <p><i>It is quite evident that <u>titanium will be widely used in industry.</u></i> Совершенно очевидно, что титан будет широко применяться в промышленности.</p> <p><i>It was he who told me the truth.</i> Именно он расска-</p>
-------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<p>“It is (was) ... that (who, which, whom, etc.)”; при переводе перед выде- -ляемым словом ставится «именно»;</p> <p>5) при сказуемом в страдательном залоге</p>	<p>зал мне правду.</p> <p><i>It is <u>seen</u> that on cooling sufficiently water forms ice.</i> Видно, что при охлаждении вода образует лед.</p>
Формаль- ное дополне- ние	<p>При последующем логическом дополнении, выраженном инфинити- вом или дополнитель- ным придаточным предложением.</p>	<p><i>Modern methods have made it profitable <u>to</u> <u>extract</u> copper from ores.</i> Современные методы сделали выгодным извлечение меди из руд.</p>

Functions of One

<i>Функция</i>	<i>Перевод</i>	<i>Примеры</i>
Числи- тельное	<p>В значении «<i>один</i>». Сочетание «one of» переводится «<i>один из</i>», а «one more» – «<i>еще один</i>».</p>	<p><i>There is <u>one more</u> distinction to be mentioned.</i> Имеется еще одно различие, которое</p>

		следует упомянуть.
Неопределенное местоимение	1. Подлежащее (не переводится, а сказуемое переводится глаголом во 2 лице ед. ч. или в 3 лице мн. ч.)	<i>One often finds great differences in comparing these compounds.</i> Часто находишь (находят) большие различия при сравнении этих соединений.
	2. Используется для замены существительного в ед. ч. или (<i>ones</i>) во мн. ч. Не переводится или переводится ранее упомянутым существительным.	<i>The electric cell is a device for converting chemical energy into electric one.</i> Гальваническим элементом является прибор для превращения химической энергии в электрическую.
	3. " <i>The one</i> " для замены ранее упомянутого существительного в значении « <i>тот, который</i> ».	<i>An elementary substance is <u>the one</u> which consists of only one kind of atoms.</i> Элементарным веществом является то, которое состоит только из одного вида атомов.

	4. “ <i>One’s</i> ” (в форме притяжательного местоимения) переводится «свой».	<p><i>One should write down the results of <u>one’s</u> experiments into a note-book.</i></p> <p>Следует записывать в тетрадь результаты своих экспериментов.</p>
--	-------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------

Functions of That

Функция	Примечание	Примеры
<p>Указательно е местоимение 1. Подлежащее</p>	<p>Стоит перед сказуемым и переводится словом «это».</p>	<p><i><u>This</u> is a red solution, and <u>that</u> is a colourless one. <u>Those</u> are chemical substances.</i></p> <p>Это красный раствор, а это - бесцветный. Это – химические вещества.</p>
<p>2. Определение</p>	<p>Определяет существительное и переводится «этот, эта, это, эти» и т. д.</p>	<p><i>The boiling point of <u>that</u> liquid is 25 °C.</i></p> <p>Точка кипения этой жидкости - 25⁰ С.</p>
<p>3. Для замены ранее упомянутого существительного</p>	<p>Переводится тем словом, которое заменяет.</p>	<p><i>Some properties of air are similar to <u>those</u> of water.</i></p> <p>Некоторые свойства воздуха похожи на свойства воды.</p>

<p>Союз, вводит придаточное предложение : 1) Подлежащее</p>	<p>Стоит перед подлежащим придаточного предложения и переводится словами «<i>то, что</i>».</p>	<p><i><u>That</u> oxygen can be liquefied only under high pressure was proved by experiments.</i> То, что кислород можно превратить в жидкость под очень высоким давлением, было доказано опытами.</p>
<p>2) Сказуемое</p>	<p>Всегда стоит после глагола-связки и переводится «<i>стоит в том, чтобы; заключается в том, чтобы</i>».</p>	<p><i>The characteristic property of water is <u>that</u> it is a good solvent.</i> Главное свойство воды заключается в том, что она хороший растворитель.</p>
<p>3) Дополнение</p>	<p>Всегда после сказуемого главного предложения и переводится союзом «<i>что</i>».</p>	<p><i>One can show <u>that</u> hydrogen doesn't support burning.</i> Можно показать, что водород не поддерживает горение.</p>
<p>4) Определение</p>	<p>Стоит после определяемого слова и переводится словом «<i>который</i>».</p>	<p><i>A barometer is an instrument <u>that</u> measures air pressure.</i> Барометр – это прибор, который измеряет давление воздуха.</p>

5)Обстоятельство	Сочетается со словами “ <i>so that</i> ”, “ <i>in order that</i> ” и переводится словами « <i>чтобы</i> », « <i>так что</i> », « <i>для того чтобы</i> ».	<i>Alcohol boils at 78° C, water – at 100° C, so that the alcohol boils away first and is first collected in the condenser.</i> Спирт кипит при 78 ⁰ С, вода при 100 ⁰ С, так что спирт выкипает первый и первый собирается в конденсаторе.
------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

II. WOULD, CONDITIONAL SENTENCES, SUBORDINATE CLAUSES

Functions of «would»

Глагол **would** может быть:

<p>1. Вспомогательным глаголом во 2-м и 3-м лице ед. и мн. числа (1-е лицо - should) во времени Future-in-the-Past для выражения будущего действия.</p>	<p>e.g. These studies also indicated that the presence of ammonium chloride would result in the production of large, readily filtered crystals. <i>Эти исследования также показали, что присутствие хлорида аммония приведет к образованию больших, легко фильтрующихся кристаллов.</i></p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>2. В главном предложении в предложениях придаточных условных 2-го и 3-го типа (переводится прошедшим временем с частицей «бы»).</p>	<p>e.g. Life would be quite different from what it is if atmosphere were composed of pure oxygen. <i>Жизнь совершенно бы отличалась от той, какова она сейчас, если бы атмосфера состояла из чистого кислорода.</i></p>
<p>3. В простых предложениях для выражения предположения (переводим прошедшим временем с частицей «бы»).</p>	<p>e.g. Iodide formed in such reactions would probably be oxidized rapidly by the cupric ion. <i>Иодид, образовавшийся в таких реакциях, вероятно, быстро окислялся бы ионом меди.</i></p>

Conditional Sentences

<p>Тип условного предложения</p>	<p><u>Главное предложение</u> – СЛЕДСТВИЕ</p>	<p><u>Придаточное предложение</u> – УСЛОВИЕ</p>
<p>I тип <i>реальные, осуществимые предположения, относящиеся к будущему или к насто-</i></p>	<p>Future Simple (shall / will + V) I'll <u>give</u> you the book Я <u>дам</u> вам эту книгу, We'll <u>go</u> to the country</p>	<p>Present Simple (V / V-s) <i>if</i> you <u>return</u> it next week. если вы <u>вернете</u> ее на следующей неделе. <i>if</i> the weather <u>is</u> fine</p>

<p>ящему времени</p>	<p>Мы <u>поедем</u> за город,</p>	<p>tomorrow. если завтра <u>будет</u> хорошая погода.</p>
<p>II тип <i>невероятные</i> или <i>маловероятные</i> предположения, относящиеся к <i>настоящему</i> или <i>будущему</i> времени</p>	<p>Future Simple-in-the Past (should / would / could / might + V) Helen <u>would write</u> to Andrew Елена <u>написала бы</u> Андрею, I <u>would ask</u> my friend about it Я <u>спросил бы</u> своего друга об этом,</p>	<p>Past Simple (V-ed / V₂) <i>if</i> she <u>knew</u> his address. если <u>бы</u> она <u>знала</u> его адрес. <i>if</i> I <u>saw</u> him tomorrow. если <u>бы увидел</u> его завтра. NB! Глагол <i>to be</i> употребляется в придаточном предложении в форме <u>were</u> со всеми лицами ед. и множ. числа.</p>
<p>III тип предположения, относящиеся к <i>прошедшему</i> времени и являющиеся <i>невыполни-</i></p>	<p>Future Perfect-in-the Past should/would/could/might + have + V₃ I <u>would have asked</u> him about it Я <u>спросил бы</u> его об этом,</p>	<p>Past Perfect (had + V-ed / V₃) <i>if</i> I <u>had seen</u> him yesterday. если <u>бы я видел бы</u> его вчера.</p>

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

III. INFINITIVE AND INFINITIVE CONSTRUCTIONS

FORMS OF INFINITIVE

Voice Tense	ACTIVE	PASSIVE
INDEFINITE INFINITIVE	to ask спрашивать (<i>вообще</i>)	to be asked быть спрошенным (<i>вообще</i>)
CONTINUOUS INFINITIVE	to be asking спрашивать (<i>в определенный момент</i>)	—
PERFECT INFINITIVE	to have asked спросить (<i>до определенного момента</i>)	to have been asked быть спрошенным (<i>до определенного момента</i>)

FUNCTIONS OF INFINITIVE

<u>1. ПОДЛЕЖАЩЕЕ</u> (на русский язык переводится <i>неопределенной формой глагола</i> или <i>существительным в именительном падеже</i>)	<u>To use</u> this method is very important. (<i>Использовать</i> этот метод очень важно.)
-----------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------

<p><u>2. ЧАСТЬ СКАЗУЕМОГО</u> (на русский язык переводится <i>неопределенной формой глагола</i>)</p> <p>а) после глагола-связки <i>to be</i>, когда подлежащее выражено существительными: <i>purpose/ object/ aim</i> (цель), <i>task</i> (задача), <i>way</i> (путь, способ), <i>method</i> (метод, способ), <i>wish</i> (желание), <i>intention</i> (намерение), <i>problem</i> (вопрос, задача)).</p> <p>В других случаях <i>to be</i> перед глаголом выражает <u>долженствование</u></p> <p>б) после модальных глаголов; после глаголов, обозначающих начало, продолжение, завершение действия; после глаголов <i>to want, to intend, to try, to hope, to promise, to decide</i> (которые без инфинитива не дают полного смысла).</p>	<p>Our aim <u>is to become</u> good specialists. (<i>Наша цель состоит в том, чтобы стать хорошими специалистами.</i>)</p> <p>These students <u>are to become</u> chemists. (<i>Эти студенты должны стать химиками.</i>)</p> <p>He <u>began to use</u> the device. (<i>Он начал использовать это оборудование.</i>)</p>
<p><u>3. ДОПОЛНЕНИЕ</u> (переводится <i>неопределенной формой</i>)</p>	<p>The manager asked me <u>to wait</u> a little. (<i>Управляющий</i></p>

<p>глагола или <i>придаточным предложением</i>)</p>	<p><i>попросил меня немного подождать.)</i></p> <p>He remembered to have read the article before. (<i>Он помнил, что читал эту статью до этого.</i>)</p>
<p><u>4. ОПРЕДЕЛЕНИЕ</u> (переводится определительным придаточным предложением с союзом <u>который</u>, сказуемое выражает долженствование или будущее время)</p>	<p>The result to be expected is important for our work. (<i>Результат, который следует ожидать, важен для нашего исследования.</i>)</p>
<p><u>5. ОБСТОЯТЕЛЬСТВО</u> (переводится <i>придаточным предложением</i> с союзом <u>чтобы, для того чтобы</u>)</p> <p>а) обстоятельство цели: – стоит в начале или конце предложения; переводится <i>придаточным предложением</i> с союзом <u>чтобы, для того чтобы</u></p> <p>– Иногда употребляется с союзами <i>in order to, so as</i> (<u>чтобы, для того чтобы</u>) <i>e.g.</i></p>	<p><u>To...use</u> this method the scientist needed new equipment. (<i>Чтобы использовать этот метод, ученому было необходимо новое оборудование.</i>)</p> <p><u>In...order...to...know</u> these processes we should study them. (<i>Чтобы знать эти процессы, мы должны изучить их.</i>)</p>

<p>НВ СЛЕДУЕТ РАЗЛИЧАТЬ инфинитив в функции <i>обстоятельства</i> и <i>подлежащего</i>, который употребляется в начале предложения. Для этого надо:</p> <ol style="list-style-type: none"> 1) Найти <u>подлежащее</u> и <u>сказуемое</u> 2) Если в предложении есть <u>подлежащее</u>, которое выражено не инфинитивом, значит инфинитив в начале предложения – <u>обстоятельство</u> 	
<p>б) обстоятельство следствия: Употребляется с наречиями <i>too</i> (слишком), <i>enough</i> (достаточно). Переводится <i>придаточным предложением</i> с союзом <i>чтобы, для того чтобы</i></p>	<p>This text is <i>too</i> difficult to translate it without a dictionary. (<i>Этот текст слишком труден, чтобы переводить его без словаря.</i>)</p>

INFINITIVE CONSTRUCTIONS

I. OBJECTIVE INFINITIVE CONSTRUCTION

(Объектный инфинитивный оборот - *сложное дополнение*)

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

Подлежащее + сказуемое + { сущ./мест-е (в объект.пад.) + Инф. }
} <i>инфинитивный оборот</i>

МЕСТОИМЕНИЯ	именит.	объектн.	именит.	объектн.
--------------------	---------	----------	---------	----------

В ОБЪЕКТНОМ ПАДЕЖЕ	падеж	падеж	падеж	падеж
		I	me	We
	you	you	they	them
	he	him		
	she	her		
	it	it		

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) становится подлежащим, а инфинитив – сказуемым.

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

Инфинитивный оборот употребляется после глаголов:

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

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

<i>to feel</i> (чувствовать)	<i>to notice</i> (замечать)
<i>to see</i> (видеть)	<i>to watch, to observe</i> (наблюдать)
<i>to hear</i> (слышать)	<i>to make</i> (заставлять)

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

II. SUBJECTIVE INFINITIVE CONSTRUCTION

(Субъектный инфинитивный оборот – 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 thought** – думают,
 - **is/are supposed** – предполагают,
 - **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.)*

PART II
TEST 1
IT, ONE, THAT

№ 1

Translate into Russian:

1. It is necessary to know foreign languages.
2. That water is a universal solvent is known to everybody.
3. Antimony¹ exists in modifications similar to those of arsenic².
4. It is dynamics that deals with³ forces that cause motion.
5. Uranium⁴ is a heavy silvery-white metal and it catches fire⁵ in fluorine.
6. It is often necessary to determine⁶ what substance is produced in a given reaction.
7. One can say that there are unlimited sources of energy in the world.
8. Our new atomic stations are more powerful than the old ones.
9. It is known that titanium⁷ is widely used in industry.
10. An elementary substance is the one which consists of only one kind of atoms.

Words and expressions:

- 1) antimony – сурьма;
- 2) arsenic – мышьяк;
- 3) to deal with – рассматривать, иметь дело с;
- 4) uranium – уран;
- 5) to catch fire – воспламеняться;

- 6) to determine – определять;
7) titanium – титан.

№ 2

Translate into Russian:

1. That the atomic weight of oxygen is greater than that of carbon¹ is well known.
2. Metal is a good conductor² of heat while wood is a bad one.
3. One way of obtaining hydrogen is to pass electric current³ through water.
4. It is usually possible to change matter from one state to the other.
5. One can show experimentally that hydrogen doesn't support⁴ burning.
6. Chemistry is a science, it deals with⁵ the properties, composition and structure of matter.
7. It is known that the composition of glass is different from that of porcelain⁶.
8. It is important that the velocity⁷ of the body is constant.
9. One believes that this procedure will simplify the experiment.
10. Now we know that all substances consist of atoms.

Words and expressions:

- 1) carbon – углерод;
- 2) conductor – проводник;

- 3) electric current – электрический ток;
- 4) to support – поддерживать;
- 5) to deal with – рассматривать, иметь дело с;
- 6) porcelain – фарфор;
- 7) velocity – скорость.

№ 3

Translate into Russian:

1. We know that air has pressure¹.
2. That water is a compound was proved at the end of the 18th century.
3. It is not easy to translate this article.
4. A barometer is an instrument that measures² air pressure.
5. It is these properties of crystals that are the most important.
6. One can express the composition of a compound by means of³ a chemical formula.
7. The atomic weight of sulphur⁴ is twice as large as that of oxygen.
8. Uranium⁵ is hard but not so hard as steel, it is reactive, it burns in air on heating.
9. Everybody knows that a gas expands⁶ as the temperature rises.
10. The properties of metals are different from those of wood.

Words and expressions:

- 1) pressure – давление;
- 2) to measure – измерять;
- 3) by means of – посредством;
- 4) sulphur – сера;
- 5) uranium – уран;
- 6) to expand – расширяться.

№ 4

Translate into Russian:

1. This worker has become one of the most honoured¹ men in our city.
2. It is to be remembered that molecules possess² kinetic energy.
3. One has to be very careful in handling³ glass things.
4. Some properties of air are similar to those of water.
5. It is the phosphate bond⁴ that contains the energy of activation.
6. Uranium⁵ is very reactive, it burns in air and catches fire⁶ in fluorine.
7. It is often convenient to divide the elements into two groups: metals and non-metals.
8. One must never forget that atomic energy can destroy the world.
9. We find it necessary to translate this article.
10. Rubber⁷ is a durable⁸ material; it is very important in industry.

Words and expressions:

- 1) honoured – уважаемый, почитаемый;
- 2) to possess – обладать;
- 3) in handling – в обращении, по отношению;
- 4) phosphate bond – фосфатная связь;
- 5) uranium – уран;
- 6) to catch fire – воспламеняться;
- 7) rubber – резина, каучук;
- 8) durable – прочный.

№ 5

Translate into Russian:

1. Molecules of solids are more concentrated than those of gases.
2. Radium¹ emits the rays which are similar to those of uranium².
3. One believes that his observation³ is adequate.
4. The melting point⁴ of titanium is 2000° above that of aluminium.
5. That water is a universal solvent is known to everybody.
6. It was Mendeleev who gave the world the Periodic Table of Elements.
7. The distance that light travels in one second is 300 thousand kilometers.
8. It is known that oxygen makes up about one half of the earth's crust⁵.
9. One must be careful with explosive⁶ substances.
10. That heat and light are necessary for life is quite clear.

Words and expressions:

- 1) radium – радий;
- 2) uranium – уран;
- 3) observation – наблюдение;
- 4) melting point – точка плавления;
- 5) Earth's crust – земная кора;
- 6) explosive – взрывчатый.

№ 6

Translate into Russian:

1. There are substances that conduct electricity rapidly and there are those that do it badly.
2. The diameter of the whole atom is of the order of¹ 10^{-8} cm, while that of the nucleus is very much smaller.
3. It is crystal structure of diamond that gives an explanation for this contrast of properties.
4. Copper is the metal used as a conductor since it combines high conductivity with low cost.
5. It is important not to confuse the physical and chemical properties of these materials.
6. It is believed that atom contains three kinds of particles – electrons, protons, neutrons.
7. In order to learn the properties of a substance one must have it in a pure form.
8. We obtained many aliphatic² compounds including unsaturated ones.
9. One should be very careful when using strong acids.
10. The problem was that when one volume of hydrogen was combined with one volume of chlorine, two volumes of hydrogen chloride would be formed.

11. It is often very important to know under what conditions two substances will react.
12. The method makes it possible to obtain the substance in a pure form.

Words and expressions:

- 1) of the order of – примерно;
- 2) aliphatic – алифатический.

№ 7

Translate into Russian:

1. The melting point of titanium is 2000°C above that of aluminium.
2. It is the law of conservation of mass that makes it possible to write chemical equations.
3. The sixty years of Russian science have shown that it develops most effectively.
4. It is known that oxygen makes up about one half of the earth's crust¹.
5. It is useful to consider temperature to be a measure of the kinetic energy of all the atoms and molecules in a given system.
6. Usually one dries the gas by calcium chloride or concentrated H₂SO₄.
7. This method of obtaining such a compound is much better than that one.
8. One must be careful with explosive substances.
9. Thorium² is attacked slowly by water, it does not readily dissolve in most acids, except hydrochloric acid.

10. One proves in several ways that this reaction is followed by an explosion.
11. In this way one obtains a copper nucleus which is isobaric³ with zinc nucleus.
12. It was in 1898 that the Curies obtained the new element radium.

Words and expressions:

- 1) Earth's crust – земная кора;
- 2) thorium – торий;
- 3) isobaric – изобарический.

№ 8

Translate into Russian:

1. Carbon that is added to steel makes it harder.
2. That chlorine destroys a large number of organic dyes is a well known fact.
3. Although the electrical conductivity of aluminum is only about 60% that of copper, aluminum is used in electrical transmission lines¹.
4. It has been known for many years that light is able to cause chemical changes.
5. It is possible to add hydrogen to different parts of a molecule by substituting various groups.
6. We subject sodium nitrate to moisture, which turns it white with liberation of ammonia.
7. It is activity of phosphorus with oxygen that is its most striking property.

8. One must remember that sulphides of many metals are used in paint industry.
9. An elementary substance is the one which consists of only one kind of atoms.
10. One obtains large quantities of CO_2 in the manufacture of quicklime².
11. Examples of polyatomic ions that do not split up³ during acid-base reactions⁴ are hydroxide or phosphate.
12. One has to remember that this reaction is accompanied by explosion.

Words and expressions:

- 1) transmission lines – линии передач;
- 2) quicklime – негашёная известь;
- 3) split up – разлагаться;
- 4) acid-base reactions – кислотно-основные реакции.

№ 9

Translate into Russian:

1. That one could find copper ions with low positive charges became clear from our experiment.
2. A thermometer is a device that determines the quantity, but not the quality of heat in a body.
3. This simple model is based on the fact that electrons repel¹ each other.
4. It is under high oxygen pressure that sodium absorbs oxygen giving superoxide NaO_2 ².

5. Copper has very low resistance to the electric current, and it is one of the best conductors.
6. It has been stated that crystalline silicon is less active than amorphous one.
7. It is easy to see why the charged particles are heavier than the neutral ones.
8. One can explain the Law of Constant composition by atomic molecular theory.
9. One understands very well the importance of water in our life.
10. Artificial diamonds are 40 per cent harder than natural ones.
11. In order to break the intermolecular attractions that hold the molecules of a compound in the condensed liquid state, it is necessary to increase their kinetic energy.
12. It is known that each square mile of soil to a depth of 6 inches contains approximately 1 g of radium.

Words and expressions:

- 1) to repel – отталкивать;
- 2) superoxide NaO_2 – надперекись (пероксид) натрия.

№ 10

Translate into Russian:

1. That a solution is an acidic one may be shown by litmus paper¹.
2. The weight of the substances that are reacting is equal to that of the product obtained.

3. The properties of a compound differ from those of its constituents.
4. It is only when the powdered substances are heated that reaction occurs.
5. Uranium is a reactive metal but sulphur combines with it only at 500°C.
6. It is the property to form solutions in both acidic and basic media² that makes aluminium amphoteric.
7. One should treat the solution with sulphuric acid, then cool and add one drop of the solution of ferrous ion.
8. One sees that the second potential for zinc is higher than that for calcium.
9. Metal is a good conductor of heat while wood is a bad one.
10. Tungsten³ oxidizes in air at elevated temperatures, although it generally has excellent corrosion resistance.
11. Sulfur is a pale yellow, odourless solid, it is insoluble in water, but soluble in carbon disulfide⁴.
12. It should be mentioned that paracrystalline structure is not only observed in the solid state but in the liquid as well.

Words and expressions:

- 1) litmus paper – лакмусовая бумага;
- 2) media – среда;
- 3) tungsten – вольфрам;
- 4) carbon disulfide – сероуглерод.

№ 11

Translate into Russian:

1. Reactions of dilute acids and the concentrated ones are not alike.
2. He evolved a theory to explain why one substance reacted with a second but not a third.
3. The book contains a large number of problems and concept questions that are helpful in university courses related to plasma, lasers and combustion.
4. He found that mercury when heated with air formed a red compound which he placed in a test tube.
5. The role of hydrogen in the structure and properties of organic compounds is unlike that of any other element.
6. A primary carbon¹ is one that is bonded to no more than one other carbon atom.
7. These trends can be explained and understood by analyzing the electron configurations of the elements.
8. It was Lavoisier who hearing of the experiment gave Cavendish's gas the name hydrogen.
9. Ionized gas is usually called plasma when it is electrically neutral and contains a significant² number of the electrically charged particles.
10. It is helpful to cover the beaker that contains the ammonia with a glass plate.
11. Not many are aware, however, that a significant amount of potable water³ in the world is purified using ozone-plasma technology.
12. Diamond is one of the hardest substances, with a high melting point and index of refraction⁴.

Words and expressions:

- 1) primary carbon – первичный углеродный атом;

- 2) significant – значительный;
- 3) potable water – питьевая вода;
- 4) index of refraction – показатель преломления.

№ 12

Translate into Russian:

1. As one can see from figure 5 the secondary electron emission¹ coefficient γ becomes relatively high.
2. It was John Dalton who prompted² that two elements could combine in different proportions under different conditions, but the resulting compounds were different.
3. These distinct³ compounds all have the same molecular formula, but only one can be called hexane.
4. Although the secondary electron emission coefficient γ is low at lower ion energies, it is not negligible⁴ and remains almost constant.
5. Plasma offers three major features that are attractive for applications in chemistry and related disciplines.
6. In the case of hydrogen it was found that recombination of atoms into molecules leads to a release⁵ of excited molecules.
7. Plasma can be applied not only for decomposition of complex oxides into simple ones but also for the synthesis of complex oxides from simple ones.
8. The total differential on the left-hand side of equation 2 is separated into two parts, one of which is zero.
9. Ions are charged heavy particles that are able to make a significant contribution to plasma-chemical kinetics.
10. Recombination of Kr_2^+ and Xe_2^+ is about 100 times faster than that of helium.

11. In covalent compounds the number of bonds which are characteristically formed by a given atom is equal to that atom's valence.
12. "Ionized" means that at least one electron is not bound to an atom or molecule, converting the atoms or molecules into positively charged ions.

Words and expressions:

- 1) electron emission – излучение электронов;
- 2) to prompt – указывать;
- 3) distinct – отдельный;
- 4) negligible – незначительный, пренебрежимо малый;
- 5) release – выпуск;
- 6) complex oxide – сложный оксид.

№ 13

Translate into Russian:

1. As one can see from Table 5, the reaction rate¹ coefficients for recombination are more than two orders of magnitude higher.
2. Phosphoric acid is one of the electrolytes used in fuel cells² although very few studies have focused attention on the activity of metallomacrocyclic³ complexes in this electrolyte.
3. It should be noted that the RS radical reacts very rapidly in step 4 and it supplies⁴ more OH⁻ to accelerate step 1.
4. IR spectroscopy⁵ is one of the most important analytical methods for molecular structure characterization.
5. There is only one report that shows evidence for the one-electron reduction of O₂ in alkaline media.

6. It is useful to begin a discussion of organic chemical reactions with a review of acid-base chemistry and terminology.
7. It was concluded that only those molecules that are directly exposed to the electrolyte and at the same time are in electric contact with the electrode are active for the reduction of O₂.
8. Remember that the filtrate⁶ is the liquid that passes through the filter paper.
9. It usually includes one or more dielectric layers located in the current path between metal electrodes.
10. The losses can be subdivided into those related to low vibrational levels, and those due to high levels.
11. It is the energy change that occurs when an electron is added to a gaseous atom.
12. In 1946 Kroll showed that titanium could be produced commercially by reducing titanium tetrachloride⁷ with magnesium.

Words and expressions:

- 1) reaction rate – скорость реакции;
- 2) fuel cell – топливный элемент, топливная ячейка;
- 3) metallomacrocyclic – металломакроциклический;
- 4) to supply – подавать, обеспечивать;
- 5) IR spectroscopy – инфракрасная спектроскопия;
- 6) filtrate – фильтрат;
- 7) titanium tetrachloride – тетрахлорид титана.

№ 14

Translate into Russian:

1. One thinks that in thermal equilibrium¹ all particles should have the same temperature and that the temperature remains constant throughout the whole region, which is in equilibrium.
2. This was the first indication that air was not a simple pure substance and therefore was not an element.
3. One of them considers the energy difference between the LUMO (lowest unoccupied molecular orbital²) of the electron acceptor and the HOMO (highest occupied molecular orbital³) of the electron donor.
4. Because of the variations in experimental procedures and conditions from one laboratory to another, it is difficult to make cross-laboratory⁴ comparisons of results reported in literature.
5. Functional groups are atoms or small groups of atoms that exhibit a characteristic reactivity when treated with certain reagents.
6. It is preferable to produce mostly hydrogen, water vapor can be added to stimulate the shift reaction, converting CO into hydrogen.
7. It is interesting to compare hydrogenization⁵ of carbon dioxide⁶ with that of carbon disulfide⁷.
8. The production of electrons by incoming ions on the electrodes is one of the major mechanisms to sustain⁸ low-temperature plasmas.
9. The maximum yield of HCN corresponds to a temperature of 3200 K, that temperature is also optimal for direct production of acetylene⁹.
10. The first factor that usually comes to mind when discussing sterilization is the thermal effect.

11. It is the electron temperature that often significantly exceeds that of heavy particles.
12. It is difficult to determine visually when the reaction is complete, since it is heterogeneous.

Words and expressions:

- 1) thermal equilibrium – термическое/тепловое равновесие;
- 2) lowest unoccupied molecular orbital – низшая незанятая молекулярная орбиталь;
- 3.) highest occupied molecular orbital – высшая занятая молекулярная орбиталь;
- 4) cross-laboratory – межлабораторный;
- 5) hydrogenization – гидрогенизация;
- 6) carbon dioxide – углекислый газ, двуокись углерода;
- 7) carbon disulfide – сероуглерод;
- 8) to sustain – поддерживать;
- 9) acetylene – ацетилен.

№ 15

Translate into Russian:

1. One says that over the past three decades low-temperature plasma applications have been extended from primarily lighting¹ to the fabrication of microelectronic devices and new materials.
2. It is possible to calculate the relative O₃ concentration in air that can lead to a doubling of initial room temperature of the air.

3. The scientist demonstrates that these losses can be attributed² to a single act of chemical reaction of synthesis.
4. Pure anhydrous nitric acid³ is a colorless liquid that solidifies at a temperature of -41.6°C when it boils in light, a partial decomposition occurs with the formation of NO_2 .
5. Rhodium⁴ is one of the most active catalysts for adsorption, surface reaction, and desorption of methane, oxygen and products of their reaction.
6. Sometimes it is possible to have domination of a polymer film growth in one part of a reactor.
7. An atomic collision⁵ is a process that takes place when two particles approach⁶ one another at a sufficiently short distance so that their interaction through different forces becomes appreciable.
8. No one should work in or enter atmospheres containing less than 19.5% oxygen – unless they are equipped with a breathing apparatus or a breathing air mask.
9. The law of conservation of mass states that there is no detectable change in the quantity of matter during an ordinary chemical reaction.
10. Nitrogen dioxide⁷ is a red-brown gas that is very soluble in water, it has an unpleasant odour and is quite poisonous.
11. The melting point of tantalum is very high, exceeded only by that of tungsten⁸ and rhenium⁹.
12. Most of the ammonia that is traded is used to make fertilizers, but considerable quantities are used to produce industrial chemicals.

Words and expressions:

- 1) lighting – освещение;
- 2) to attribute – объяснять, приписывать;
- 3) anhydrous nitric acid – безводная азотная кислота;
- 4) rhodium – родий;
- 5) atomic collision – атомное столкновение;
- 6) to approach – приближаться, подходить;
- 7) nitrogen dioxide – диоксид азота, двуокись азота;
- 8) tungsten – вольфрам;
- 9) rhenium – рений;
- 10) fertilizer – удобрение.

TEST 2
WOULD, CONDITIONAL SENTENCES,
SUBORDINATE CLAUSES

№ 1

Translate into Russian:

1. If sugar and water are mixed, crystals of sugar disappear.
2. When one gram of ice melts, 78 calories of heat are absorbed¹.
3. If the vessel² is made of a high-melting metal, this method can be used at temperatures up to 1500° C.
4. If air were a single compound, it would have a definite composition by weight.
5. Many ordinary objects we use in our every-day life would not be available³ without chemistry.
6. If the model fits⁴ well, the observed data will be correct.
7. It was known that proteins were composed of amino acids.
8. A solution is a mixture of materials, one of which is usually a fluid.
9. If a drop of ink is added, the water becomes coloured.
10. He put the test-tube⁵ where the teacher told him.

Words and expressions:

- 1) to absorb – поглощать;
- 2) vessel – сосуд;
- 3) available – доступный;
- 4) to fit – подходить, соответствовать;

5) test-tube – пробирка.

№ 2

Translate into Russian:

1. If three or more elements are combined in a substance, the structural possibilities become greater.
2. We know electricity produces heat.
3. When heavy metal nitrates are heated, the metal oxide is produced.
4. Since a compound contains two or more different elements, it also contains two or more different atoms.
5. If a piece of tin is warmed, it melts.
6. Large molecules have more electrons and nuclei¹ that create attractive forces².
7. He finished the experiment in time although it was very difficult for him.
8. Many years have passed since Popov invented³ the radio.
9. Any element when it combines with oxygen forms an oxide.
10. Uranium⁴ is hard but not so hard as steel, it is reactive, it burns in air on heating.

Words and expressions:

- 1) nuclei – (мн.ч от nucleus) ядра;
- 2) attractive forces – силы притяжения;
- 3) to invent – изобретать;
- 4) uranium – уран.

№ 3

Translate into Russian:

1. If the four carbon atoms form a ring, two hydrogen atoms must be lost.
2. Oxygen can be liquefied provided that pressure is sufficiently high.
3. If a cation carries a charge of +1, then it is monovalent¹.
4. One end of the molecule has a partial positive charge while the other end has a partial negative charge.
5. Water freezes at 0°C unless it contains salt.
6. When an element consists of two identical atoms it is called a diatomic² molecule.
7. Water is a compound substance which consists of two elements hydrogen and oxygen.
8. As a liquid is heated, the temperature is increased.
9. If we heated the solution, the reaction would proceed³ smoothly.
10. It is necessary that they should apply the new method.

Words and expressions:

- 1) monovalent – одновалентный;
- 2) diatomic – двухатомный;
- 3) to proceed – протекать.

№ 4

Translate into Russian:

1. The oil floats on the water as it is less dense.
2. If the density of a substance and either¹ mass or volume is known, volume or mass can be calculated.
3. At -273°C the molecules would have no motion at all².
4. If a gas were colourless, we would not notice its formation.
5. It would be very difficult to obtain this substance without high pressure.
6. As the oxidation to NO^3 occurs, this gaseous mixture burns.
7. When four carbon atoms are joined together, two different structures are possible.
8. Water dissolves⁴ many substances which makes it a universal solvent.
9. Organic chemistry deals with substances which are composed in part⁵ of carbon.
10. While you work in the laboratory you must be very careful.

Words and expressions:

- 1) either...or... – или...или...;
- 2) at all – совсем;
- 3) NO (nitrogen oxide) – оксид азота;
- 4) to dissolve – растворять;
- 5) in part – частично.

№ 5

Translate into Russian:

1. It would be wrong to consider rain water as really pure.
2. You must be careful with mercury¹ as it is very poisonous.
3. Filtrates are the solutions which pass through the filter paper² during filtration.
4. If the cation³ charge is +2, then it is divalent⁴.
5. Electrolytes⁵ are substances that produce ions upon dissolving.
6. If he mixes 3 parts of carbon with 4 parts of oxygen he will make carbon monoxide⁶.
7. Since aluminium is light and strong, it is widely used in industry.
8. The process which oxygen takes part in⁷ is known as oxidation.
9. Many ordinary objects of our every-day life would be impossible without chemistry.
10. He will finish his experiment in time provided he works hard.

Words and expressions:

- 1) mercury – ртуть;
- 2) filter paper – фильтровальная бумага;
- 3) cation – катион;
- 4) divalent – двухвалентный;
- 5) electrolytes – электролиты;
- 6) carbon monoxide – окись углерода;

7) to take part – принимать участие.

№ 6

Translate into Russian:

1. If a compound contains three or more different elements, additional data is required to obtain the formula on the basis of valencies.
2. If the substances are gaseous and are at the same temperature and pressure, their gram-molecular weights must occupy equal volumes.
3. Calcium carbonate would have gradually decomposed had it been heated a longer time.
4. When this happens the cations are surrounded by water molecules.
5. The test solution which will be analyzed is prepared by the laboratory assistant.
6. The different natural forms an element can exhibit are called allotropic forms of this element.
7. Fats that contain no double bonds in their fatty acid chains are referred to as saturated fats¹.
8. If the number of covalent bonds to an atom is greater than its normal valence it will carry a positive charge.
9. It would be difficult to make nitrogen combine with other elements because of its inertness.
10. The rays travelling through a layer of gas use part of their energy to ionize the gas they pass through.
11. As chemistry developed, it was observed that elements could be grouped according to their chemical reactivity.
12. Titanium² is as strong as steel, but it is 45% lighter.

Words and expressions:

- 1) saturated fats – насыщенные жиры;

2) titanium – титан.

№ 7

Translate into Russian:

1. If we determine the boiling point of each solution and then proceed to subtract¹ the boiling point of pure water we will get a boiling point difference.
2. Iron can be detected by chemical means if it is present in a sample to an amount of 1 part per million or greater.
3. A glass of water would become coloured were a drop of ink added to it.
4. When two carbon atoms are joined together by two bonding pairs of electrons, a double bond is formed.
5. Since hydrogen is a common component of organic compounds, its amount and locations need not be specified in most cases.
6. The products of oxidation are called oxides of the elements the compound was composed of.
7. If a tin or iron vessel were cooled by liquid air it would become very brittle.
8. Our main purpose is to discover and describe the ways in which atoms bond together to form molecules.
9. The number of atoms which are typically bonded to a given atom is called the valence of that atom.
10. It would be difficult to point out² all the equipment necessary for this work in an analytical laboratory.
11. Although the atom is built from oppositely charged particles, its overall³ charge is neutral.
12. If a large piece of this metal is put into some water, the heat of the reaction will cause the metal to melt.

Words and expressions:

- 1) to subtract – вычитать;
- 2) to point out – указывать, показывать;
- 3) overall – общий.

№ 8

Translate into Russian:

1. If an object floats on water it is less dense than water.
2. If you have some potassium which is covered with peroxides and you throw it in water, a dangerous explosion can occur.
3. Could a substance be cooled to -273°C , the molecules would be motionless.
4. When extremely dilute HNO_3 is used, either nitrogen gas (N_2) or the ammonium ion (NH_4^+) may be formed.
5. Residues¹ are the solids which remain on the filter paper after filtration.
6. Although these distinct compounds all have the same molecular formula, only one can be called hexane.
7. Litmus has the property of changing colour according to the chemical properties of the solutions it comes in contact with.
8. Matter is defined as anything that has mass and occupies space.
9. Density is a physical property of matter, as each element and compound has a unique density associated with it.
10. Hall was an American chemist, who discovered an electrochemical method for the isolation of pure aluminum from its compounds.
11. The rays uranium compounds emit cause the air to become a conductor of electricity.
12. The scientist concluded that the molecule broke apart² into a positive fragment and negative fragment.

Words and expressions:

- 1) residues – осадки;
- 2) to break apart – распадаться.

№ 9

Translate into Russian:

1. If the oxides of antimony were basic in character they would react with nitric acid forming the nitrate of antimony.
2. Rubidium's¹ density is greater than that of water, so it would sink to the bottom if it didn't react.
3. It would be desirable to use only boiled water for drinking.
4. Were concentrated sulphuric acid mixed with hydrogen at low temperature, oxygen rich in ozone would be evolved.
5. When a neutral magnesium atom loses two electrons, it forms the Mg^{2+} ion.
6. It is known that plastics are organic substances which are made synthetically by polymerization.
7. Some compounds are highly toxic to humans, while others are essential for life.
8. The air we are surrounded with is about one-fifth oxygen by volume.
9. The fact that elements combine in definite proportions, led to the conclusion that the structure of matter was discrete.
10. The most common reducing agents² are metals, for they tend to lose electrons in their reactions with nonmetals.
11. If arsenic were added to pure germanium³, the conductivity of the latter would increase.

12. If the properties of celluloid⁴ had been perfect, it could have been the basis for a new industry.

Words and expressions:

- 1) rubidium – рубидий;
- 2) reducing agent – восстановитель;
- 3) germanium – германий;
- 4) celluloid – целлулоид.

№ 10

Translate into Russian:

1. If a volatile sodium is introduced into the colourless flame or a gas burner, the flame turns yellow.
2. Substitution¹ in this case should give two different compounds if all the hydrogen atoms react.
3. If one electron were removed, a net positive charge would be left.
4. It would be more correct to say that isoprene² is a natural monomer.
5. Were those two substances heated, the reactions between them would be more probable.
6. When the litmus paper turns from blue to red the process of acidifying is completed.
7. Hydrogen and fluorine react to form hydrogen fluoride, which contains HF molecules.
8. It remains to establish how many atoms constitute one molecule of hydrogen.
9. It followed that the atomic weight of oxygen was 8.

10. Some compounds with metal-carbon bonds are not regarded as organometallic, because the carbon atom is not part of an organic group.
11. Oxidation numbers are the charges that the elements have when they are part of a chemical compound.
12. If sufficient pressure is applied, chlorine may be converted to its liquid state even without cooling.

Words and expressions:

- 1) substitution – замена, замещение;
- 2) isoprene – изопрен.

№ 11

Translate into Russian:

1. If sulphur is present as H_2S or if CO_2 is present, any of these compounds will be a poison for many catalysts and will partly or completely inhibit¹ catalyst activity.
2. If the reaction proceeded in a water-alcohol solution in the presence of hydrated² $ZnCl_2$, the PBP (pentagonal-bipyramidal) complex³ would be obtained.
3. If there were no forces, all matter would exist in a gaseous state, and life would not be possible.
4. They would have obtained better results had they taken a stronger acid.
5. The fact that over the last decade, more than 1000 papers have been published annually on Phthalocyanine⁴ research indicates that the Phthalocyanine ligand⁵ remains of interest to many researchers.
6. When the ionization degree is low, the plasma is called weakly ionized plasma, which is the main focus of plasma chemistry.

7. The most noticeable chemical characteristic of nitric oxide is the ease with which it combines with oxygen to form nitrogen dioxide⁶.
8. Many metals in later groups are much less electropositive than the typical definition would suggest.
9. The first compound of chlorine we'll study in detail is its compound with hydrogen, represented by the formula HCl.
10. However ammonium sulfate's⁷ share of the nitrogen fertilizer⁸ market has declined because of the trend toward products that contain more nitrogen, such as ammonium nitrate⁹ and urea¹⁰.
11. Although there is no implication that the compound is ionic, the names ending in *-ide* are the same as those used for anions (e.g. fluoride).
12. When one or both cobalt atoms were replaced by other metal atoms, hydrogen peroxide was formed either as the main product or as an intermediate.

Words and expressions:

- 1) to inhibit – тормозить, препятствовать;
- 2) hydrated – гидратированный;
- 3) pentagonal-bipyramidal complex – пентагонально-бипирамидальная структура;
- 4) phthalocyanine – фталоцианин;
- 5) ligand – лиганд;
- 6) nitrogen dioxide – диоксид азота, двуокись азота;
- 7) ammonium sulfate – сульфат аммония;
- 8) fertilizer – удобрение;
- 9) ammonium nitrate – нитрат аммония, аммиачная селитра;
- 10) urea – мочеви́на.

Translate into Russian:

1. If the pressure is low and the external circuit¹ has a large resistance to prohibit a large current, a glow discharge² develops.
2. Plasma-chemical processes through electronic excitation³ can be energy effective if they initiate chain reactions.
3. For BN the electronegativity difference between elements is much less, and it would be more natural to think of polar covalent bonding.
4. Hadn't antioxidants⁴ been added, chemical stability and long life of plastics wouldn't have been possible.
5. When oxidized NiR was put in contact with NO, the intermediate⁵ was directly observed by spectroscopy.
6. In some of the early nitrogen processes, atomic nitrogen, which is formed by ionizing molecular nitrogen with electrical discharges⁶, was used.
7. The first and second oxidation potentials⁷ increase linearly with the ionic radius of the central metals, while the reduction potentials⁸ show no observable change.
8. The periodic law D.I. Mendeleev discovered created a new era in the history of chemistry.
9. The spatial profile of energy may have consequences on the transport coefficients, provided that some energy-dependent processes also exist.
10. We probably would not have computers and cell phones like we have now without plasma processing⁹.
11. When carbon forms bonds to atoms other than hydrogen, such as oxygen, nitrogen, and sulfur, the structural possibilities become even greater.
12. A formal charge on an atom is essentially the charge that would remain if all covalent bonds¹⁰ were broken.

Words and expressions:

- 1) external circuit – внешний контур;
- 2) glow discharge – тлеющий разряд;
- 3) electronic excitation – электронное возбуждение;
- 4) antioxidant – антиоксидант, противooksидлитель;
- 5) intermediate – промежуточный продукт, посредник;
- 6) electrical discharge – электрический разряд;
- 7) oxidation potential – окислительный потенциал;
- 8) reduction potential – восстановительный потенциал;
- 9) plasma processing – плазменная обработка;
- 10) covalent bond – ковалентная связь.

№ 13

Translate into Russian:

1. Generation of the additional amount of CO, predicted by the formula, becomes possible only if the vibrational energy¹ accumulated by CO₂ molecules in the high-temperature plasma zone is sufficient to do that.
2. Unless synthetic polymers possessed such valuable properties, they would not be so important for industry.
3. If the aim has been to make a known compound, one needs to check its identity and purity.
4. Very heavy elements can decay² by spontaneous fission³, when the nucleus splits into two fragments of similar mass.
5. The reaction rate⁴ coefficient k is an integral factor, which includes information on the energy distribution⁵ functions and depends on temperatures or mean energies of the collision partners.

6. But the density of neutrals slightly decreases with the electric current density since high currents cause a gas temperature to rise.
7. The methods for molecular structure characterization the chemists use in this laboratory are very effective.
8. We must remark that heavy particles (ion and neutrals) are unable to accumulate electron recombination energy⁶ fast enough in their kinetic energy.
9. Metal phthalocyanines⁷ known for several dozen years still arouse strong interest due to important peculiarities putting them in the centre of many research groups' attention.
10. The hydrogen will retard⁸ the formation of nickel sulfide, which will prevent or minimize poisoning of the catalyst.
11. If a substance passed from the solid state directly to the vapour state, this change would be called sublimation⁹.
12. If they had known about this new discovery earlier, they would have applied the method in their investigation.

Words and expressions:

- 1) vibrational energy – энергия колебаний, колебательная энергия;
- 2) fission – расщепление;
- 4) reaction rate – скорость реакции;
- 5) energy distribution – распределение энергии;
- 6) recombination energy – энергия рекомбинации;
- 7) metal phthalocyanines – металлофталоцианины;
- 8) to retard – замедлять, задерживать;
- 9) sublimation – возгонка, сублимация.

Translate into Russian:

1. If sodium hydroxide is the absorbent, pure sodium nitrite and sodium nitrate may be recovered.
2. It will be possible to reach capacities of 4 000 tonnes/day if the casing¹ of the synthesis gas compressor is increased to the next size, which is available.
3. They would be thermodynamically stable compounds if their S-H bonds were as strong as in H₂S.
4. Had water been added to the mixture, more acid would have been formed.
5. If microdischarges² formed at a new spot each time the polarity changes, the discharge would appear uniform.
6. If we didn't know the nature of the radioactive elements it would be difficult to deal with them.
7. It has been found that the O₂ reduction currents³ are directly proportional to the amount of catalyst present, when the catalyst is adsorbed on the electrode surface.
8. The quantum theory predicts only probability distributions⁴, which are given by the square of the wavefunction⁵ and which show where electrons are more or less likely to be found.
9. The elemental analysis⁶ of the obtained crystals gives the composition of 1:1, but the thermogravimetric analysis⁷ indicates that the crystals are more complicated.
10. Some compounds the scientists described by the ionic model have fairly low melting points and others are very insoluble in water.
11. This profile is the result of the particle's random thermal motion and collisions with gas molecules, provided that initially all particles start from the same position.
12. Some nitrogen compounds provide pleasant-tasting flavors and sweet perfumes while others are so vile⁸ in taste and odor that they are beyond description.

Words and expressions:

- 1) casing – корпус, оболочка;
- 2) microdischarge – микроразряд;
- 3) reduction current – ток восстановления;
- 4) probability distribution – вероятностное распределение;
- 5) wavefunction – волновая функция;
- 6) elemental analysis – элементный анализ;
- 7) thermogravimetric analysis – термогравиметрический анализ;
- 8) vile – отвратительный, ужасный.

№ 15

Translate into Russian:

1. If a cation forms a stable complex, the addition of a complexing agent¹ at 1 M or greater generally will convert the free ion to complex ion.
2. If only one formula for sulfur dioxide were correct, then the double bond to oxygen would be shorter and stronger than the single bond.
3. Unless the collision rate² changes very rapidly, we may expect the mean energy³ of electrons to increase.
4. If there were a double bond between the carbon atoms, the chemical formula might be written: CH₂CH₂.
5. If a tin or iron vessel were cooled by liquid air it would become very brittle.
6. When thiols⁴ were added in the solution, the oxidation peak⁵ increased very slightly.

7. In addition to high chemical activity, the ions can have significant kinetic energy, which determines their contribution, for example, in reactive ion etching⁶.
8. It is sometimes stated that “typical” ionic compounds have high melting points and dissolve well in polar solvents⁷ such as water, whereas covalent compounds have low melting points and dissolve well in nonpolar solvents.
9. From the upper curve of the figure A we can see adding only 15% plasma energy allows for a two-fold decrease of the energy cost of hydrogen production.
10. It's a pleasure to recommend this work to students and scientists who are interested in the fundamentals and applications of plasma chemistry.
11. 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.
12. If he had weighed these substances, he would have noticed the differences in weights.

Words and expressions:

- 1) complexing agent – комплексообразователь, комплексообразующий агент;
- 2) collision rate – скорость столкновения;
- 3) mean energy – средняя энергия;
- 4) thiol – тиол;
- 5) oxidation peak – пик окисления;
- 6) ion etching – ионное травление; ионно-лучевое травление;
- 7) polar solvent – полярный растворитель.

TEST 3

INFINITIVE AND INFINITIVE CONSTRUCTIONS

№ 1

Translate into Russian:

1. These students are trying to obtain a transparent¹ liquid.
2. We consider the hotness or coldness of body to depend on the quantity of heat of the body.
3. Experiments proved carbon to occur in many compounds.
4. Zinc reacts with hydrochloric acid² to produce hydrogen gas.
5. The heat of the reaction is sufficient to ignite³ sodium.
6. To understand this phenomenon is to understand the structure of atoms.
7. A. Popov, a Russian scientist, was the first to invent radio.
8. To determine the volume of a gas at a definite temperature is rather easy.
9. During the experiment, they saw that bubbles began to form in the vessel⁴.
10. One of the ways of obtaining oxygen is to decompose water by the electric current⁵.

Words and expressions:

- 1) transparent – прозрачный;
- 2) hydrochloric acid – соляная кислота;
- 3) to ignite – воспламеняться;
- 4) vessel – сосуд;
- 5) electric current – электрический ток.

№ 2

Translate into Russian:

1. Dalton was the first to deduce¹ scientifically an atomic theory from experimental data.

2. To determine which of the gases is denser we must only compare their molecular weights.
3. This method is not accurate² enough to give reliable results.
4. The experiment is to be carried out in our laboratory next month.
5. Metallic palladium³ has an unusual ability to absorb hydrogen.
6. The difficulty will be to obtain the necessary substance in its pure form.
7. Crystalline silicon is hard enough to scratch⁴ glass.
8. Oxygen has considerable ability to form double bonds⁵.
9. To synthesize water we may allow hydrogen and oxygen to combine.
10. The aim of our research work is to find the necessary data.

Words and expressions:

- 1) to deduce – выводить;
- 2) accurate – точный;
- 3) palladium – палладий;
- 4) to scratch – царапать;
- 5) double bonds – двойные связи.

№ 3

Translate into Russian:

1. The experiment is to show the dependence of temperature on solubility.

2. They are the last to leave the laboratory.
3. In order to understand the procedure the chemists considered the following analogy.
4. The heat is to be liberated¹ during this reaction.
5. One nitrogen molecule reacts with three hydrogen molecules to produce two ammonia molecules.
6. Boron² is known to be a rare element.
7. The purpose of this article is to show the necessity of this experiment.
8. Our scientists have to solve many vital³ problems.
9. It is often convenient to divide the elements into two groups: metals and non-metals.
10. We saw the temperature of the solution fall rapidly.

Words and expressions:

- 1) to liberate – выделять;
- 2) boron – бор;
- 3) vital – важный, насыщенный.

№ 4

Translate into Russian:

1. The air is known to contain one fifth oxygen by volume.
2. The kinetic theory of gases considers a gas to be made up of particles.
3. They watched the temperature rise gradually.
4. In order to learn the properties of a substance we must have it in its pure form.
5. The use of zinc to protect steel and iron was very important.

6. Two or more elements combine to form a compound in a fixed proportion¹ by weight.
7. To clarify² the resulting solution they have used filters.
8. We can watch this substance dissolve easily in acids but not in water.
9. The students want to know who will deliver³ lecture on chemistry.
10. The problem was to solidify⁴ the given substance.

Words and expressions:

- 1) fixed proportion – определенная пропорция;
- 2) to clarify – очищать;
- 3) to deliver – читать;
- 4) to solidify – затвердевать.

№ 5

Translate into Russian:

1. The engineers were glad to have obtained such good results in the latest tests.
2. Joule and other scientists proved heat to be a form of energy.
3. The reaction with aluminium serves to illustrate this statement.
4. Hydrogen has the potential to ignite¹ and explode.
5. Every worker is to know safety rules.
6. One way of obtaining hydrogen is to pass electric current² through water.
7. To accelerate³ reaction is often impossible without using some catalysts.

8. Plastics are known to be a class of materials not to be found in nature.
9. We shall have to do many experiments.
10. In order to⁴ dissolve this substance one must heat it.

Words and expressions:

- 1) to ignite – воспламеняться;
- 2) electric current – электрический ток;
- 3) to accelerate – ускорять.

№ 6

Translate into Russian:

1. All elements of Group I react with the halogens to form the important compounds known as the alkali halides¹.
2. This substance proved to be a new element to which the name "neon" was given.
3. He didn't expect the salts to be produced not only by interaction of acids and bases, but also by the types of chemical reactions.
4. The scientists found many substances to be stable in the presence of light.
5. Roentgen is known to have discovered a new kind of rays which he called X-rays.
6. Most substances have to be heated before they catch fire² even in pure oxygen.
7. One of the main objects of experiments on mesons³ was to determine the properties of particles found in cosmic rays.
8. If a material is to be bleached with chlorine it must be moistened.

9. To test for a soluble iodine we are to add the solution of carbon disulphate, chlorine water and shake the mixture.
10. Ions have been found by numerous experiments to move as easily through a gel as through the liquid solution.
11. The main task confronting our chemical industry is to ensure the efficient use of raw materials.
12. The results seem to agree with theoretical prediction.

Words and expressions:

- 1) halides – галоиды;
- 2) to catch fire – воспламеняться;
- 3) mesons – мезоны.

№ 7

Translate into Russian:

1. The purpose of this investigation is to develop a precise procedure for the analyses of lithium-rich mixtures.
2. When sulfuric acid is to be diluted with water it must be poured gradually into an excess of water.
3. The quantity of solvent to be evaporated will be the difference between that in the initial and final solutions.
4. The product obtained may be treated by such means as distillation to separate it into its component.
5. In order to convert the bicarbonate¹ into the normal form it is first necessary to neutralize the carbonic acid present.
6. The process of ionization is likely to consist in the removal of an electron from the molecule of the gas.

7. The molecules seem to be continually moving with a great velocity in all directions.
8. The weight of a certain volume of gaseous chlorine was found to equal 1,5805 g.
9. Nickel catalysts appear to suffer² permanent decrease in activity when exposed to a higher temperature.
10. The results of this experiment have shown the above compound to contain some unknown element.
11. Atoms, such as nitrogen and oxygen have a tendency to have partial negative charges.
12. To produce artificial diamonds from carbon high pressure and high temperature are required.

Words and expressions:

- 1) bicarbonate – гидрокарбонат, кислая соль угольной кислоты;
- 2) to suffer – испытывать, претерпевать.

№ 8

Translate into Russian:

1. To determine which of the two gases is denser we must compare their molecular weights.
2. It is to be noted that bromine is one of the elements to be handled with great care.
3. D.I. Mendeleev was the first to discover the law of dependence of the properties of elements upon their atomic weights.
4. The mercuric oxide to be heated is in one of the test-tubes.

5. Nickel catalyst appears to suffer¹ permanent decrease in activity when exposed to higher temperatures.
6. The reaction is likely to take place slowly in ordinary light.
7. We expect nitrogen trioxide to be paramagnetic, but it is so unstable that pure NO₃ is not available for studies of this type.
8. In order to get salts you are to know methods of their preparation.
9. The material to be attacked by X-rays is placed on the screen.
10. Radium appeared to be an element whose salts were found to be isomorphous with the corresponding salts of barium.
11. The method to be described in detail is based upon some properties of these rays.
12. Our purpose has been to determine the effect of X-rays on the substance under consideration².

Words and expressions:

- 1) to suffer – испытывать, претерпевать;
- 2) under consideration – рассматриваемое, исследуемое (вещество).

№ 9

Translate into Russian:

1. They are to pay attention to the fact that sulphuric acid has a great affinity¹ for water.

2. The method of qualitative analysis to be employed depends upon the nature of the substance to be analysed.
3. The way of obtaining cobaltic oxide² is to heat cobaltous nitrate in air.
4. Lomonosov's experiments showed the green colouration of glass to be due to the presence of chromium.
5. To explain the behaviour of the electrons in the atom, the new concepts of quantum theory had to be introduced.
6. The particles are sufficiently large to be clearly discerned.
7. The HNO_2 formed by this reaction further decomposes to form more NO and nitric acid.
8. To maintain a constant temperature in a small or large container was an important technical problem for a very long time.
9. The size of a crystal appears to depend on the presence and the amount of certain non-metallic elements.
10. Under a microscope they saw amorphous silicon consist of very small crystals.
11. Each hydrogen atom has one electron and needs two to complete its first energy level.
12. In chemical calculations it is usual to express volume in milliliters and weight in grams.

Words and expressions:

- 1) affinity – сродство;
- 2) cobaltic oxide – окись кобальта.

Translate into Russian:

1. One method of manufacturing hydrogen is to decompose steam by the use of coke¹.
2. Students know plasticity at elevated² temperatures to be a natural property of glass.
3. In order to dissolve this substance one must heat it.
4. These compounds proved to be mixtures of the normal compound with the excess of the metal.
5. Mechanical properties of fluids are the subject to be considered in the present article.
6. All alkaline earth carbonates are likely to crystallize in these two forms.
7. Without knowing chemistry it is not always easy to make clear the distinction between chemical combinations and physical changes.
8. Simple solutions are believed to contain either molecules or parts of molecules.
9. The first scientist to discover this phenomenon was Lomonosov.
10. Ramsay and Soddy were the first to make a sensational discovery, that helium is a disintegration product³ of radium.
11. The nature of the atmosphere was found to have a significant effect on the wettability and surface tension of the metal.
12. Electronegativity is the power of an atom in a molecule to attract electrons to itself.

Words and expressions:

- 1) coke – кокс;
- 2) elevated – повышенный;
- 3) disintegration product – продукт распада.

№ 11

Translate into Russian:

1. To assess¹ why some substances are unknown, it is important to consider different possible routes to decomposition.
2. To understand the behavior of electrons in atoms and molecules requires the use of quantum mechanics.
3. The primary objective of this review was to draw attention to the fundamental requirements for synthesis of improved catalysts operating at low overpotentials².
4. The calcium carbonate³ will normally be added in the process if calcium ammonium nitrate⁴ is to be produced.
5. Ionization is the first elementary plasma-chemical process to be considered in this chapter.
6. In this section, several trends of redox⁵ properties are described in order to illustrate the relationship between structural characteristics and the electrochemical properties.
7. As with electrons in atoms, it is necessary to use the quantum theory to account for the details of nuclear structure and stability.
8. Substances such as HCl are covalent molecules that undergo protolysis⁶ only in solvents polar enough to solvate⁷ ions, and when a base is present.
9. Langmuir was one of the pioneers who studied gas discharges⁸ and defined plasma to be a region not influenced by its boundaries.
10. Both dimethyl sulfoxide⁹ and dimethyl sulfone¹⁰ are known to rapidly react with OH which leads to effective further oxidation.

11. In order to reduce the velocity of the reaction the concentration of the reactants was altered in the following way.
12. At high temperatures and pressures nitrogen combines with most of the elements to form nitrogen compounds although many of these compounds are not very stable.

Words and expressions:

- 1) assess – оценивать, определять;
- 2) overpotential – перенапряжение;
- 3) calcium carbonate – карбонат кальция;
- 4) calcium ammonium nitrate – кальций аммиачная селитра;
- 5) redox – окислительно-восстановительный;
- 6) protolysis – протолиз, протолитическая реакция;
- 7) to solvate – сольватировать;
- 8) gas discharge – газовый разряд, электрический разряд в газе;
- 9) dimethyl sulfoxide – диметилсульфоксид;
- 10) dimethyl sulfone – диметилсульфон;
- 11) alter – изменять.

№ 12

Translate into Russian:

1. Quenching¹ starts in this kinetic modeling at the moment of maximum HCN concentration; the cooling rate is supposed to be equal to 10^6 K/s.

2. Some of these discharges² are to be considered in detail in the following section in connection with their efficiency in the plasma ignition³ and stabilization of combustion.
3. The usual laboratory method of preparation of methane is to heat a mixture of fused⁴ sodium acetate⁵ with soda lime⁶.
4. Selection of a process for hydrogen manufacture from hydrocarbons and coal depends on the raw material and its cost, the scale of operation, the purity of the synthesis gas to be produced, etc.
5. The function of the neutrons in the nucleus is to overcome the repulsive force⁷ between the protons.
6. Having carried out this experiment we can see the components of mixture retain⁸ their properties.
7. The complex ions appear to have regular⁹ octahedral structures¹⁰ in spite of the presence of a nonbonding electron pair on the central atom.
8. The remaining non-transition metals include the elements of group 12 although they are formally part of the *d*-block, as the *d* orbitals in these atoms are too tightly bound to be involved in chemical bonding.
9. To describe ionization induced by the electrons with velocities significantly exceeding the velocities of atomic electrons, the Born approximation¹¹ can be applied.
10. N_2^+ ions in non-thermal plasmas at elevated pressures have a tendency to form complex ions which decreases the yield of N atoms in the recombination¹².
11. Ammonia is used to make nitric acid and other chemicals including many plastics and pharmaceuticals¹³.
12. When the scale of the material to be etched¹⁴ approaches nanometer scale, we should pay attention to the change of the physical quantity.

Words and expressions:

- 1) quenching – закалка, быстрое охлаждение;
- 2) discharge – разряд;
- 3) ignition – воспламенение, вспышка, запал;
- 4) fused – расплавленный;
- 5) sodium acetate – ацетат натрия;
- 6) soda lime – натровая известь;
- 7) repulsive force – сила отталкивания;
- 8) to retain – сохранять;
- 9) regular – правильный;
- 10) octahedral structure – октаэдрическая структура;
- 11) Born approximation – аппроксимация Борна, борновское приближение;
- 12) recombination – рекомбинация, воссоединение;
- 13) pharmaceuticals – лекарственные препараты;
- 14) to etch – гравировать, травить.

№ 13

Translate into Russian:

1. Henry Cavendish and Joseph Priestly were the first scientists to investigate this endothermic¹ plasma-chemical process in the eighteenth century.
2. The aim of this review is to summarize only the type of information that can be obtained from the most important methods of characterization.

3. If the filtrate contains elements to be determined it is usually necessary to reduce the volume by evaporation.
4. You know the term “red fuming nitric acid”² to apply to nitric acid that contains more than 17% NO₂ and has a density of more than 1,48 g/cm³.
5. To establish whether an element is essential³ is therefore difficult, especially as some essential elements (e.g. Co) are present in low concentrations.
6. Hypervalence⁴ is sometimes considered to be a consequence of the availability of further orbitals for bonding.
7. In the laboratory we can watch this substance dissolve easily in acids but not in water.
8. The objective of the etching⁵ is to remove material from surfaces, which can be chemically selective and anisotropic⁶.
9. The stream then passes through a water separator⁷ to remove most of the water.
10. The electric circuit⁸ is completed by transferring the arc⁹ to an external anode where the arc is to be applied.
11. The main purpose of the book is to give experimental evidence which lies in the sphere of electronics and nuclear physics.
12. We have basically two types of materials to be etched¹⁰ in ultra large-scale integration: one is metal or poly-Si with adequate electric conductivity, the other is dielectric SiO₂.

Words and expressions:

- 1) endothermic – эндотермический;
- 2) red fuming nitric acid – красная дымящаяся азотная кислота;
- 3) essential – важный, основной;

- 4) hypervalence – гипервалентность;
- 5) etching – травление, гравирование;
- 6) anisotropic – анизотропный;
- 7) water separator – водоотделитель, сепаратор воды;
- 8) electric circuit – электрическая цепь, электрическая схема;
- 9) arc – дуга, дуговой разряд;
- 10) to etch – гравировать, травить;
- 11) ultra large-scale integration – ультрабольшая интеграция, ультравысокая степень интеграции.

№ 14

Translate into Russian:

1. The wafer¹ to be etched² is set on the substrate holder³, which is usually electrically isolated from the reactor base potential.
2. In order to use biomass as an effective renewable source of energy, the conversion process should occur at a much faster pace.
3. To investigate the properties of oxygen accurately samples of pure gas are to be obtained.
4. To get two nuclei close enough together for fusion⁴ requires enormously high energies, which are normally found only at extreme temperatures.
5. Since the LUMO (lowest unoccupied molecular orbital⁵) energy appears to have no dependence on the number of fused benzene rings⁶, it is necessary to clarify the relationship between the LUMO energy and the π -system.
6. When sodium and potassium hydroxides are treated with an acid they are said to be neutralized.

7. While dissolving calcium chloride in water the researchers saw the temperature fall rapidly.
8. He considered the experimental data for different atoms and molecules obtained by the authors to be inaccurate.
9. Higher OH^- concentrations could stabilize the superoxide ion⁷ but 1 M NaOH might not be concentrated enough to achieve this purpose.
10. Electron repulsion between d electrons in complexes is found to be less than in the free gas-phase.
11. To find the conditions required to reach such a high ionization degree, one should analyze the degradation⁸ of δ -electrons formed by the fragments.
12. The role of plasma in the system is to stimulate exothermic process without using catalysts, which are not effective at relatively high temperatures.

Words and expressions:

- 1) wafer – пластина;
- 2) to etch – гравировать, травить;
- 3) substrate holder – держатель подложки;
- 4) fusion – плавление, сплавление;
- 5) lowest unoccupied molecular orbital – низшая незанятая молекулярная орбиталь;
- 6) benzene ring – бензольное кольцо;
- 7) superoxide ion – супероксид-ион;
- 8) degradation – деградация, разрушение, распад.

№ 15

Translate into Russian:

1. The most obvious function of a solvent is to facilitate¹ the mixing of solid substances, where reaction would otherwise be very slow.
2. The reforming² process is to be considered using a combination of the catalytic and plasma approaches³ in the two possible system configurations.
3. In 1780 Henry Cavendish, an English scientist, used an electric spark⁴ to combine atmospheric nitrogen and oxygen to make nitrogen oxides.
4. This temperature is supposed to be homogeneous⁵ and the same for all degrees of freedom, all components, and all possible reactions.
5. While maintaining the necessary conditions they watched the reaction proceed violently.
6. The amount H_2O_2 detected at the ring is likely to be much lower than the amount actually produced because of the competing reactions.
7. Figure 2 shows the shift in the oxidation and reduction potentials to depend on the size of the π -system for a series of macrocycles⁶.
8. To separate the observed distances into the sum of two ionic radii is, however, difficult to do in an entirely satisfactory way.
9. The lead ion is probably too large to remain in the phthalocyanine⁷ core during the ionization processes.
10. The increase in activity seems to be associated with the electron-withdrawing⁸ effect of the axial ligand⁹.
11. Nitrogen dioxide¹⁰ causes the sulfur dioxide¹¹ to be oxidized to sulfur trioxide¹², which then unites with water to form sulfuric acid.
12. Carrying out experiments one should keep in mind that many processes are to be taken into account for a complete explanation of the phenomenon.

Words and expressions:

- 1) facilitate – облегчать, содействовать, способствовать;
- 2) reforming – преобразование, реформинг;
- 3) approach – подход, метод, способ;
- 4) electric spark – электрическая искра, искровой разряд;
- 5) homogeneous – гомогенный, однородный;
- 6) macrocycle – макроцикл;
- 7) phthalocyanine – фталоцианин;
- 8) electron-withdrawing – электроноакцепторный;
- 9) ligand – лиганд;
- 10) nitrogen dioxide – диоксид азота, двуокись азота;
- 11) sulfur dioxide – диоксид серы, сернистый ангидрид;
- 12) sulfur trioxide – трёхокись серы; серный ангидрид.

Список использованной литературы

1. Мифтахова, Н. Х. Английский язык для химико-технологических вузов : учеб. для вузов. Ч. 1. Учебник для I-II курсов/ Н.Х. Мифтахова. - М. : Высш. шк., 1981. - 368 с.
2. Степанова, Т. А. Английский язык для химических специальностей = English for Chemists : A Practical Course : практ. курс / Т.А. Степанова; филолог. фак., СПб. гос. ун-та. - 2-е изд., стер. - М. : Академия, 2006. - 285 с.

3. Cox, P.A. Inorganic Chemistry. Second Edition. Instant Notes. Garland Science/BIOS Scientific Publishers, 2004. – 286 с.
4. Fridman, A. Plasma Chemistry. - Cambridge University Press, 2008. – 978 с.
5. Makabe, T Plasma Electronics: Applications in Microelectronic Device Fabrication. – CRC Press, Taylor & Francis Group, 2006. –330 с.
6. Maxwell, G.R. Synthetic Nitrogen Products: A Practical Guide to the Products and Processes. – Springer Science, 2005. – 432с.
7. Англоязычные периодические издания из области химической технологии.

Учебное издание

Ганина Вера Владимировна
Киясь Вероника Анатольевна

**КОНТРОЛЬНЫЕ ЗАДАНИЯ
ПО ГРАММАТИКЕ АНГЛИЙСКОГО ЯЗЫКА
ДЛЯ СТУДЕНТОВ-БАКАЛАВРОВ 2 КУРСА И
СТУДЕНТОВ-МАГИСТРАНТОВ
ХИМИКО-ТЕХНОЛОГИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ**

Учебное пособие

Подписано в печать 22.05.2017. Бумага писчая.

Формат 60×84 1/16. Усл. печ. л. 4,65

Тираж 50 экз. Заказ

**ФГБОУ ВО «Ивановский государственный
химико-технологический университет»**

Отпечатано на полиграфическом оборудовании кафедры
экономики и финансов ФГБОУ ВО «ИГХТУ»
153000, г. Иваново, Шереметевский пр., 7