АЗӘРБАЈЧАН ССР
АЛИ ВӘ ОРТА ИХТИСАС Тәһсили НАЗИРЛИЈИ
С.М.КИРОВ АДЫНА ГЫРМЫЗЫ ӘМӘК БАЈРАГЫ ОРДЕНЛИ
АЗӘРБАЈЧАН ДӨВЛӘТ УНИВЕРСИТЕТИ

Тәбиәт факүлтәләри үзрә
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CHEMISTRY

АДУ-нун кимја факүлтәсинин
III курс Азәрбајчан бөлмәси-тәләбәләри үчүн
"Методики чалышмалар"

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Бир нечə сөз

Өлкəмиздə харичи диллəрин тəдрисинин даһа да тəкмиллəшдирилиб күнүн тəлəбləри сəвиjjəсинə галдырылмасы үчүн бүтүн али, орта вə техники-пешə мəктəбləриндə дərслəр jени програм тəлəбləри əсасында гурулур, дərслərдə əjани вə техники васитəлərдən даһа сəмəрəли истифадə едилир. Лакин буна бахмajараг университетин бүтүн факүлтəлəриндə доғма дилин гајда-ганунларына əсаслана билəн харичи дил дərсликləри, методики вəсаит, лүғəт вə шифаһи оху материалларынын, ихтисаса аид терминалоҗи лүғəтлəрин jохлуғу харичи диллəрин тəдрисиндə чидди чəтинлик төрədир. Белə ки, jухары курсларда харичи вə мəркəзи нəшрijjатларын бурахдығы китаб вə журналлардан истифадə етмək үчүн тəлəбəлəр лазыми материаллары харичи диллərдən рус дилинə орадан да Азəрбајчан дилинə төрчүмə етмəли олурлар. Нəтичəдə исə ихтисас jохлама ишləриндə, диплом вə елми ишləрин jазылмасында, аспирантураја гəбул вə минимум имтаһанларында əсаслы чəтинликлəр ортаја чыхыр. Бу үмуми чəтинлији гисмən дə олса арадан галдырмаг мəгсəди илə АДУ-нун Гəрби Аврупа диллəри кафедрасынын əмəкдашлары төрəфиндən əввəллəр бүтүн техники факүлтəлəрдə вə о чүмлəдən химиjа факүлтəсиндə тəдрис просесиндə газанылан төчрүбəjə əсасən "Методики чалышмалар" төртиб едилмишдир. "Методики чалышмалар" 25 мəтн вə бир əлавəдəн ибарəтдир. Бүтүн мəтнлəр үjғун тапшырыг вə лүғəтлə тə'мин олунмушдур. Лүғəтин төртибиндə бүтүн мəтнлəри əһатə едəн jени сөз вə сөз бирлəшмələринин вə хүсуси илə бүтүн химиjа терминлəринин төрчүмə вə шərти ишарəлəри верилмишдир.

Өминик ки, "Методики чалышмалар" химиjа факүлтəсиндə инкилис дили дərсləринин марагли вə сəмəрəли кечирилмəсинə көмək едə биләчəкдир.

Мүəллифлəр

D.I.MENDELEYEV - GENIUS OF RUSSIAN SCIENCE

The Entire Soviet Union paid tribute to the memory of D.I. Mendeleyev on the occasion of the 60th anniversary of the death of the brilliant Russian scientist whose discoveries ushared in a new era in the development of chemistry and all modern science. The periodic system of the classification of elements, discovered by Mendeleyev, laid the foundation for modern chemistry. Prior to Mendeleyev chemistry could hardly be regarded as a scientifically grounded system of knowledge. Chemists throughout the world possessed only fragmentary data about the properties of various substances gained in the cource of experiments.

Mendeleyev's periodic law served as a mighty stimulus for the further development of world scientific thought. Discussing Mendeleyev's work Frederic Engels wrote in his "Dialectics of Nature", "Mendeleyev, by unconsciuously applying Hegel's low on the transition of quantity to quality, performed a scientific exploit".

More than sixty years ago Soddy, the well-known British chemist, wrote that Mendeleyev's law will always remain the most reliable compass for the solution of the most intricate and varied problems of chemistry.

When Mendeleyev discovered his periodic law scientists were aware of only 52 elements. But with remarcable exactness he predicted the properties of elements unknown in his time, elements which he said would fill in the vacant places in his table.

One of these elements yet to be discovered Mendeleyev placed between calcium and titanium and named ekaboron, because he cla-

imed its properties would resemble those of boron. There were two other elements for which there were vacancies in the fifth row of his table between zink and arsenic. One of the yet unknown elements he named ekaaluminium, the other, ekasilicon. All these three elements were discovered during Mendeleyev's lifetime. First came the discovery of gallium, which possessed all the properties Mendeleyev had predicted for ekaaluminium. Next came scandium, with all the properties of ekaboron, and lastly, germanium, which proved identical to Mendeleyev's ekasilicon. These discoveries proved beyond all shadow doubt correctness of the main premises on which Mendeleyev founded the periodic system.

The continued progress of science enabled man to delve deeply into the mysteries of the structure of matter. Mendeleyev may rightly regarded as the founder of atomic science, and the theory of the structure of the atom which originated after mendeleyev's death shed further light on the profound significance of his periodic law.

Until recently the periodic table ended with the 92nd element uranium. Recent discoveries have added a 93rd element, neptunium, a 94th, plutonium, a 95th, americium, and 96th, curium. In these new advances Mendeleyev's law was the lodestar of all investigators.

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Mendeleyev also conducted extensive research along other lines, such as in gases and solutions. He is the author of the hydrate theory of solutions.

But the activities were not confined solely to chemistry. A man of great erudition and knowledge, his investigations embraced a wide rang. He published more than 500 scientific works and is credited with important contributions in the field of physics meteorology and aeronautics. The famed chemist is one of the founders of the modern science of aeronautics. On becoming convinced that the upper layers of the atmosphere comprise the "great weather laboratory" he made a study of the principles of aeronautics. His work on the resistance of liquids and aeronautics remains to this day one of the fundamental monographs on this problem. At the first scientific gathering held in honour of Mendeleyev, N.ZHUkovsky, father of RUssian aviation, discussing the services rendered to aeronautics by Mendeleyev, said: "While enjoying the fruits of the labour of our great scientist, we must pay due tribute to his memory by explaning to future generations his true role in the greatest of mankind's victories, the victory over the aerial ocean ".

Eminent theoretician that he was Mendeleyev also strove to tap nature's wealth for the benefit of man. The scientist took a great interest in the conquest of the North, the development of Ural's metallurgy and the Donets coal fields.

"The beacon of science of", he said, "must illuminate the depths of the earth to enable man to see in the darkness the immense natural wealth stored there".

"The Seed of science will yield a harvest for the people!" was one of Mendeleyev's prophetic utterances. And indeed in the Soviet Union the seed of science has produced a rich harvest.

In Mendeleyev's time there were less than 1.000 graduate chemists in all Russia. Ten's of thousands of chemists are at work in our country, which has built up a large modern chemical industry. Soviet scientists now march in the front ranks of world science.

Mendeleyev's life and work constitute a shining example of devoted creative labor to be followed by present and future generations of Soviet scientists.

WORDS AND EXPRESSIONS

genius - [ˈdʒi:njəs] - бөјүк, даһи.
entire - [ɪnˈtaɪə] - бүтөв, там.
tribute - [ˈtrɪbju:t] - хөрч, мөблөғ.
memory - [ˈmeməɾɪ] - хатирә, јаддаш.
on the occasion of - [əˈkeɪʒən] - мүнасибәти илә.
anniversary - [ˌænɪˈvə:səɾɪ] - илдөнүмү, јубилеј.
brilliant - [ˈbrɪljənt] - бриљант, ә'ла, көзәл.
discovery - [dɪsˈkʌvəɾɪ] - тапынты, кәшф.
to usher - [ˈʌʃə] - көчирмәк, ә'лан етмәк.
periodic - [ˌpɪəɾɪˈɔdɪk] - периодик, дөврү.
classification - [ˌklæsɪfɪˈkeɪʃən] - классификасија, бөлкү.
prior - [ˈpraɪə] - гөдөр, дәк, әввәл.
to regard - [rɪˈgɑ:d] - сајмаг, сајылмаг.
throughout - [θruˈaut] - һәр јердә.
fragmentary [ˈfrægməntəɾɪ] - фрагмент, парча.
to gain - [geɪn] - алмаг, әлдә етмәк.
mighty - [ˈmaɪtɪ] - күчүү, нөһәнк.
stimulus - [ˈstɪmjuləs] - стимул, тәсир.

"Dialectics of Nature"-[ˌdaɪəlekˈtɪksəv ˈneɪʧə] - табиатин диалектикасы.
unconsciously -[ʌnˈkɔnʃəslɪ]- тесадүфен, дүнүнмеден.
transition of quantity to quality-[trænˈzɪʃənəvˈkwɔntɪtɪtə kwɔlɪtɪ]
to perform -[pəfɔ:m] -ојнамаг/рол/. - кемијјетин кејфијјәтә кечмеси.
reliable compass -[rɪˈlaɪəbl ˈkʌmpəs] - еһтибарлы компас.
intricate -[ˈɪntrɪkɪt] - гарышыг, долашыг.
to be aware -[əˈweə] - билмәк, акаһ олмаг.
remarcable - [rɪ ma:kəbl] - ә'ла, гәшәнк.
exactness - [ɪgˈzæktnɪs] - дәгиглик.
to predict -[prɪˈdɪkt] - вахтындан әввәл демәк.
vacant place -[ˈveɪkənt pleɪs] - бош јер.
ekaboron - [ekəˈbɔ:rɔn]-екаборон.
to claim - [klеɪm] - тәсдиг етмәк,тәләб етмәк.
to resemble -[rɪˈzembl] - охшамаг.
boron - [ˈbɔ:rɔn] - бор.
ekaaluminium -[ekəˌæljuˈmɪnjəm] - екаалуминиум.
ekasilicon - [ekəˈsɪlɪkɔn] - екасиликон.
lifetime - [ˈlaɪftaɪm] - һәјатында, һәјаты боју.
identical - [aɪˈdentɪkəl] - бәрабәр.
shadow doubt -[ˈʃædou ˈdaut]- кәлкәли, шүбһәли.
mystery - [ˈmɪstərɪ] - сирр.
until recently -[ənˈtɪlˈri:sntlɪ]- јахын вахтларадәк.
lodestar - [ˈloudstɑ:] - сәһра улдузу.
activity - [æk ˈtɪvɪtɪ]- фәалијјәт, иш.
to confine -[kən ˈfaɪn]- һәдде/чәрчивәје/салмаг.
solely - [ˈsoulɪ] - јеканә, мүстәсна.
erudition - [ˌeru:ˈdɪʃən] - савад, елм.
to embrace -[ɪmˈbreɪs] - ећатә етмәк, дөврәје алмаг.

contribution – [ˌkɔntrɪ'bju:ʃən] – хидмәт.
meteorology – [ˌmi:tjə'rɔlədʒɪ] – метеороложи
aeronautics – [ˌɛərə'nɔ:tɪks] – аеронавтика.
famed – [feɪmd] – шәрәфли, мәшһур.
convinced – [kən'vɪnst] – инанылмыш.
generation – [ˌdʒenə'reɪʃən] – нәсл.
aerial ocean – ['ɛərɪəl 'ouʃən] – һава бошлуғу/океаны/.
theoretician – [θɪə'retɪʃən] – нәзәриҗҗечи.
~ strove – [strouv] – чалышды.
to tap – [tæp] – дәҗмәк.
wealth – ['welθ] – вар, дөвләт, сәрвәт.
benefit – ['benɪfɪt] – кәлир, фајда.
to illuminate – [ɪ'lju:mɪneɪt] – ишыгландырмаг.
immence – [ɪ'mens] – бөјүк, нәһәнк.
prophetic – [prə'fetɪk] – вахтындан әввәл сөјлә .нәм.
utterance – ['ʌtərəns] – ифадә, тәләффүз.
graduate – ['grædjuɪt] – гуртармаг/алы мәктәби/.
to march – ['mɑ:tʃ] – аддымламаг, ирәлиләмәк.
devoted – [dɪ'voɪtɪd] – садиг, сәдагәтли.
creative labor – ['kri:eɪtɪŋ] – јарадычы әмәк.

EXERCISES

I. Answer the questions

1. What was D.I.Mendeleyev? 2. When the Soviet people marked D.I.Mendeleyev's birthday last? 3. By whom the periodic system

of the classification of elements discovered? 4. When the periodic system of classification of elements was discovered? 5. What do you mean under the term of periodic system? 6. Where do we use the periodic system of classification of elements? 7. Where there any people at that time by whom Mendeleyev's great discovery were supported? 8. How many elements were there when Mendeleyev discovered the periodic system of classification of elements? 9. Who wrote that Mendeleyev's law will always remain the most reliable compass for the solution of the most intricate and varied problems of chemistry? 10. How many elements were discovered during Mendeleyev's lifetime? 11. How many elements were discovered after the death of Mendeleyev? 12. Who is the author of the hydrate theory of solutions? 13. Does Mendeleyev's discovery play great role in our days?

II. Put questions to the sentences

1. The scientist took a great interest in the conquest of the North. 2. The Seed of science will yield a harvest for the people. 3. Indeed in the Soviet Union the seed of science has produced a rich harvest. 4. Until recently the periodic table ended with the 92nd element uranium. 5. In these new advances Mendeleyev's law was the lodestar of all investigations.

III. Describe the theme by your own words

1. The use of Mendeleyev's laws today

2. Mendeleyev and other Russian scientists

ABOUT SOME ELEMENTS

(Oxygen, Hydrogen, Carbon, Sulphur)

Oxygen - is an element of utmost importance to us as all living things would die without it. Nearly 50 per cent of matter composing the earth and its atmosphere oxygen and about one-fifth by volume of the air is free oxygen. Oxygen in the combined state makes up eight-ninths of the weight of water and two-thirds of human and animal bodies. Oxygen becomes liquid at -183° C. and solid at 218° C..

Oxygen is an active element and may combine approximately with all other elements. The combining of oxygen with another substance is called oxidation. Iron will rust and many other metals will tarnish when exposed to oxygen. These processes of rusting and tarnishing are caused by combining of the metals with oxygen of the air. Whe oxygen combines with another substance, an oxide is formed. Oxides of metals when found naturaly are called ores. Iron is produced from an iron oxide, or an iron ore, by the process of reduction.

WORDS AND EXPRESSIONS

element - ['elimənt] - элемент.
utmost importance - [ʌtmoust impɔ:təns] - чох вачиб.
all living things - [li:viŋ θiŋz] - бутун чанлылар.
one-fifth - [wʌnfifθ] - бешдә/н/ бир.
voluma - ['vɔljum] - тутум, hечм.
in the combined state - ['kɔmbaindsteit] - бирлешмә шәклиндә.
lissome - ['laisəm] - еластик; чевик.

eight-ninths -[eɪt 'naɪnθs] - докгузда/н/ бөккиа.
two-thirds - [tu:θɜ:dz] - үчдө/н/ ики.
human body - ['hju:mən'bɔdɪ] - инсан организми.
to combine -[kəm'baɪn] - бирлөштирмөк, гошмаг.
approximately -['əprɔksɪmɪtlɪ] - тегрибөн.
to rust - [rʌst] - пасланмаг.
to tarnish -['tɑ:nɪʃ] - лөкөлөмөк, чирклөндирмөк.
rusting - ['rʌstɪŋ] - пасланма.
tarnishing -[tɑ:nɪʃɪŋ] - лөкөлөнме, корланма.
iron ore - [aɪən ɔ:] - дөмир филизи.
reduction -[rɪ'dʌkʃən] - азалма, ихтисар олма.

EXERCISES

I. Put questions (general and special) to the sentences

1. Nearly 50 per cent of matter composing the earth and its atmosphere is oxygen. 2.Oxygen in the combined state makes up eight-ninths of the weight of water and two-thirds of human and animal bodies. 3.Oxygen becomes liquid at — 183° C. and solid at 218°C. 4.Oxygen is an active element and may combine approximately with all other elements. 5.Oxides of metals found naturally are called ores.

II. Chose the theme and write a composition

1. The importance of oxygen in our life
2. The importance of oxygen for plants
3. Oxygen in medicine
4. Getting of oxygen in laboratory condition

Hydrogen - Very little hydrogen is found free in nature. Combined hydrogen is found in all living things. It is contained in all acids and hydroxides. Water is one-ninth hydrogen by weight. Hydrogen is the lightest substance known. Pure hydrogen when burnt with oxygen produces a very high temperature but very little light. Hydrogen has a strong tendency to combine with oxygen. This tendency is sufficiently strong for hydrogen to take oxygen away from metallic oxides, which process is called reduction.

EXERCISES

I. Answer the questions

1. What is water composed of ? 2.What gases does it contain ? 3. What are the properties of oxygen and hydrogen ? 4.What is generaly used for putting out the fire ? 5.What gas makes things burn ? 6.At what temperature does water become solid ? 7. What is the freezing point of water ? 8.How do we make ice liquid ? 9.How do we distinguish water from ice ? 10.What may be compressed easier : a gas or a liquid ? 11.What can reduce the volume of a gas ? 12.Why must water be purified ?

II; Chose the theme and write a composition

1. The importance of hydrogen for men
2. Getting of hydrogen from mixed gases
3. Hydrogen in industry
4. Getting of hydrogen in laboratory condition

Carbon - Carbon occurs in several allotropical forms. When the same element occurs in different forms, these different forms are called allotropic. Diamonds are crystalline forms of pure carbon. Graphite is another form of crystalline carbon. Carbon is also found in amorphous forms, that is, forms that do not have a definite structure. The amorphous forms of carbon are very abundant and include coal, lignite, and peat. Coke, lampblack, boneblack, and charcoal are amorphous forms of carbon that are manufactured artificially.

At ordinary temperatures all forms of carbon are very inert, but at high temperatures they all burn forming carbon dioxide, or, in a limited supply of oxygen, carbon monoxide. At high temperatures carbon acts as a reducing agent and thus removes oxygen from the oxides of many metals. This is essentially the process of reducing metals from their ores.

WORDS AND EXPRESSIONS

allotropical - [ˌælɔ'trɔpɪkəl] - аллотропик, дөйишкөн.
diamond - ['daɪəmənd] - бриллиант.
graphite - ['græfaɪt] - графит.
amorphous - [ə'mɔ:fəs] - аморф, кеде-кетур.
abundant - [ə'bʌndənt] - варлы, зөнкин.
lignite - ['lɪgnaɪt] - боз дан көмүр.
peat - [pi:t] - торф.
coke - [kouk] - кокс.
lampblack - ['læmpblæk] - нис, гурум.
boneblack - ['bounblæk] - сумук көмүр.
charcoal - ['tʃa:koul] - агач көмүр.

artificially -[ˌɑ:tɪˈfɪʃəlɪ]- сун'и.
ordinary - ['ɔ:dɪnrɪ] -ади, садэ.
inert - [ɪnə:t] - тесирсиз,зеиф.
limited - ['lɪmɪtɪd] - нуудланмыш.
monoxide - [mɔnɔksaɪd]- монооксид.
to act - [ækt] - нэрекэт етмек.
reducing agent -[rɪ'dju:sɪŋ'eɪdʒənt]-азалан мадде.
to remove - [rɪmu:v]- нэрекэт етдирмек.

EXERCISES

I. Put questions to the sentences (general and special questions)

1. Carbon occurs in several allotropical forms. 2.Diamonds are crystalline forms of pure carbons. 3.Carbon is also found in amorphous forms. 4.The amorphous forms of carbon are very abundant and include coal, lignite, and peat. 5.At ordinary temperatures all forms of carbon are very inert. 6.At high temperatures carbon acts as a reducing agent and thus and removes oxygen from the oxides of many metals.

II. Chose the theme and write a composition

1. The importance of carbon in life
2. Getting of carbon in industry
3. Getting of carbon in laboratory
4. The importance of carbon for plants

A L U M I N I U M

We know different kinds of metals in nature. The heavy metals include iron, copper, tin, lead and some others. Some metals are light (aluminium), some are hard (iron) and others are soft (tin, lead). Aluminium is a metal found in clay. It is the most abundant metallic element found in nature only in the form of compound. Aluminium is a very important metal used in many industries. It has a white colour, does not corrode and is resistant to all inorganic acids except hydrochloric. Aluminium things are in wide use. Aluminium combined with steel and other metals forms a mixture of metals called an alloy. Alloys formed in combination with aluminium are better for various purposes than the basic metal itself. Engineers often use combined metals in industry. Its importance is growing from day today.

WORDS AND EXPRESSIONS

tin - [tɪn] - галај.
aluminium - [ˌæljuˈmɪnjəm] - алуминиум.
lead - [led] - гурғушун.
clay - [kleɪ] - кил.
in the form of compound - ['kɔmpaund] - теркиб шеклинде.
to corrode - [kə'roud] - пасланмаг/демир/.
inorganic - [ˌɪnɔ:'gænɪk]- гејри-үзви.
alloy - ['ælɔɪ] - әринти.
purpose - ['pə:pəs] - мегсәд.
combined metal - ['kɔmbaind'metl]- гарышыг метал.

E X E R C I S E S

I. Answer the questions :

1. Is aluminium light or heavy? 2. Do we found aluminium in a pure form in nature? 3. What mineral contains aluminium? 4. Do we use aluminium in construction? 5. Do we use it in everyday life? 6. Can you name some things made of aluminium? 7. Are aluminium and gold of the same colour? 8. What is the colour of each metal? 9. Can we combine aluminium with other metals?

II. Chose the theme and describe :

1. Birth of aluminium in our country
2. Aluminium in everyday life
3. Aluminium in technics
4. Aluminium in future

ALLOYS

The most useful metals are iron, copper and aluminium. However, only small quantities of the above metals are used in their pure form. The great majority of useful metallic materials is formed from combinations of the above metals, known as alloys.

An alloy is an intimate mixture of two or more metals melted together. Mixtures of this kind are generally mechanical in their nature; in some cases, they may form chemical compounds. As a rule, when two metals melted together form an alloy, the substance formed is, for all practical purposes, a new metal.

Metals are usually mixed in their liquid state to form an alloy. If the metals chosen dissolve in each other when they are liquid, the solution will form an alloy after solidification. Metals that do not dissolve in each other when liquid will not form an alloy when they solidify. A steel containing some metallic element other than iron and carbon, is generally known as "special steel". These various metals, when added to steel in certain precentages, increase the hardness and the toughness of the steel.

WORDS AND EXPRESSIONS

majority - [mə'dʒɔriti] - чохаяг, оловрыллар.
combination - [ˌkɔmbi'neiʃən] - сыралаш.
an intimate mixture - ['intimit] - захын/сохар/ гарышыг.
to melt - [melt] - эрижек, дүмдөктөмек.
for the practical purposes - [præktikəl pə:pəsiz] - практи маселелер үчүн.
solidification - [səˌlidifi'keiʃən] - бекиме.
certain percentage - ['sə:tn pə'sentidʒ] = мэлшер %
toughness - ['tʌfnis] - даамалдыг, дайынгаалыг.

E X E R C I S E S

I. Put questions (general and special) to the sentences:

1. Aluminium alloys are most important in everywhere (3) .

2. Aluminium alloys are better than pure metals (2) .

3. An iron is a thing used to iron clothes (2). 4. Metals form the most important materials for industry.(3) 5. Any material increases in size when heated.(2) 6. Rust destroys iron, but wood does not rust. 7.Weight is the property of all forms of matter.(3) 8. Sand has no form in its natural state.(3) 9. Liquid fuels are largely used in industry and transport.(4) 10. Somebody may get aluminium alloys in laboratory conditi - ons easily. (4)

II. Translate into Azerbaijan(On Keeping Secrecy)

Some peoples idea of keeping a secret is to refuse to tell who told it to them.

(His Luck)

One morning the nurse came to the bed of a soldier in the hospital and saw that the man was dead.

" His good luck," commented the nurse, " because the colonel - our chief - wanted to send him to the guardhouse for gold bricking!"

W A T E R

No one can think about the life without getting water. The impurities contained in water may be derived from the ground with which it has been in contact, or by contamination with sewage or factory wastes. In general the impuruties in water constitute four classes :

I. Dissolved gases, such as oxygen, carbon dioxide, hydrogen sulphide, etc.

II. Soluble crystalloids, consisting of definite chemical compounds which can not be removed by sedimentation or filtration

III. Soluble colloids, consisting of material of very high molecular weight which will not settle or separate, and can be filtered only through semi-permeable membranes.

IV. Suspended water which will settle or can be filtered.

I. Dissolved gases may comprise two groups : (a), those whose solubility diminishes sufficiently with increase of temperature in the solution, and which may be removed by merely heating the water in open heaters, or in closed vessels with the aid of vacuum;(b) those required chemical treatment. Acid gases may be neutralised (with calcium hydroxide or sodium carbonate), resulting in precipitation, or not, according to individual circumstances. Oxygen may be removed by passing the water over metallic iron, which is readily oxidized to the ferric state and precipitated, owing to hydrolysis.

II. The soluble crystalloids include most of the impurities occuring in natural waters, and their removal generally involv-

ves precipitation by chemical treatment. The presence of these substances in greater or less amounts imparts to the water those properties which render it hard, soft, saline, or alkaline. Some of these substances may be partially or wholly removed by merely heating the water. Here two groups are distinguished : (a) those which evolve a gas at higher temperatures and from insoluble bodies; (b) those whose solubility decreases as the temperature increases in the solution; thus hydrated salts in solution lose water of hydration as the temperature rises and pass into less hydrated and less soluble forms.

The more common soluble crystalloids are the bicarbonates; sodium chloride, sulphate, and carbonate; iron salts; and silica . These are the substances which cause the most difficulty in technical work, and especially when the water is used in steam boilers.

Hard water contains salts of calcium, magnesium, or iron and is defined as one which precipitates soap from solution. Thus hardness is determined by a standard soap solution. Temporary hardness is due to the presence of bicarbonates of iron and the alkaline earth metals; the neutral carbonates are insoluble but dissolve in water containing free carbon dioxide, forming CaH (CO) , MgH (CO) , etc. Permanent hardness is due to the presence of soluble neutral sulphates and chlorides of calcium and magnesium.

Soft water usually contains very little mineral matter. Rain water as it falls is very soft, and if collected from clean surfaces is suitable for most purposes. Natural waters

collected from ground containing little calcium or magnesium in soluble form is fairly soft as a rule; but if the water has percolated through soil containing peat or decaying vegetable matter, it is often discolored by dissolved organic matter, and may contain organic acids which cause corrosion of iron or other metals.

Saline and alkaline waters contain the sulphates, carbonates or halogen salts of the alkali metals, in rather large amounts. Sea water and many ground waters (springs,wells) are characteristically saline (mineral waters). Alkaline waters are high in carbonates and sulphates; as e.g. the "alkali" waters of the western states.

III. Colloidal substances have very large molecular weight, and are characterized by the tendency to absorb or condense on the boundary surfaces of precipitated matter, if these surfaces are relatively large. Thus to remove colloidal matter from solution, a flocculent or finely divided amorphous precipitate may be produced in the water, which absorbs the colloidal matter and attaches it to the precipitate. Crystalline precipitates have relatively small surfaces, and do not serve well for removing colloidal matter.

The purification of water for industrial use consists in the partial or complete removal of the objectionable substances suspended or dissolved in it. This is often difficult, owing to the nature of the impurities; the size of the plant required for large works is also an item of concern. The quality of the water available should be considered in locating the works.

Water containing suspended matter only may be purified by sedimentation, followed by sand filtration; but this is often combined with chemical treatment, by which precipitate is formed in the water. This precipitate acts mechanically to entangle the suspended matter; and it also acts as an absorption agent on emulsion colloids, such as dissolved organic coloring matter, grease or oils, glutinous substances, and many kinds of factory wastes. Aeration by spraying into the air, or by trickling in thin films over large surfaces, accelrates the escape of carbon dioxide, or hydrogen sulphide, while absorption of oxygen aids precipitation of iron from solution. Bacteria and other organisms are frequently destroyed in sewage effluents, and in municipal supplies, by treatment with hypophlorites, ozone, or copper sulphate. Generally the raw water is mixed with some soluble salt, such as aluminium or ferrous sulphate, which is precipitated as aluminium or iron hydroxide by the action of the alkaline substances in the water, or added to it latter. This gelatinous precipitate encloses suspended matter, and combines with soluble organic coloring matter by adsorption; by filtration on sand filters it is removed, carrying with it the impurities. But this increases the soluble impurity by the alkaline sulphates left in the water.

Water for boiler supply is generally treated to reduce the hardness or to neutralize its corrosive properties; the operation is called "softening". Temporary hardness is removed by some of the following methods:

I. Boiling the water, usually in "feed-water heaters", to de-

compose the bicarbonates:

$$CaH(CO)_2 = CaCO - HO—CO$$

Feed-water heaters are heated by exhaust steam, or waste flue-gases, and may be "open", when working under atmospheric pressure, or "closed" if under internal pressure (as economizers), or under vacuum. Open heaters permit the ready escape of dissolved gases and decomposition of bicarbonates, with precipitation of iron, calcium, and magnesium, but for complete separation of the alkaline earths, a small amount of sodium carbonate must be added to the water in the heater, to decompose any permanent hardness. Closed heaters working under pressure (economizers) afford less complete separation of hardness, since the gases cannot readily escape. In vacuum heaters the gases are removed, and the water is purified.

2. Treatment with calcium hydroxide ("milk of lime") :

$$CaH(CO) - Ca(OH) = 2CaCO - 2HO$$

The clear calcium hydroxide solution obtained by letting the undissolved lime settle is preferable for this, but frequently unsettled "milk of lime" is used. The required amount of quick lime is slaked in a little water, and the "milk" thoroughly mixed with the water to be purified.

The sludge of calcium carbonate is removed by settling in suitable tanks, or by a filter-press.

3. Treatment with sodium carbonate (soda-ash) :

$$CaH(CO) - Na\,CO = CaCO - 2NaHCO$$

The permanent hardness is less easily remedied, for in these

causa treatment of the water leaves some substance more or less deleterious in solution :

1. $CaSO - Na\ CO = CaCO - Na\ SO$
2. $CaSO - Ba(OH) = BaSO - Ca(OH)$
3. $CaCL - NaCO = 2\ NaCL - CaCO$

Much care is necessary to avoid an excess of the chemical added.

WORDS AND EXPRESSIONS

impurity - [ɪm'pjuərɪtɪ] - мадде, смес.
contamination- [kən,tæmɪ'neɪʃən] - парчаланма, ajрылма.
sewage - ['sju:ɪdʒ] - ахар су.
sedimentation- [sedɪmen'teɪʃən] - чөкдүр/үл/ме.
colloid - ['kɔlɔɪd] - каллоид.
to settle - ['setl] - jерлешдирмек, hелл етмек.
semi-permiable- [semɪ 'pə:mjəbl] - jарым кечиричи/неми/.
membrane - ['membreɪn] - мембран, тебеге.
suspendid - [səs'pendɪd] - асылмыш, асылы.
to diminish- [dɪ'mɪnɪʃ] - кичилтмек, азалтмаг.
sufficiently- [sə'fɪʃəntlɪ] - лазымы гедер.
to require - [rɪ'kwaɪə] - телеб етмек.
to neutralise- ['nju:trəlaɪz] - нейтраллашдырмаг.
circumstance- ['sə:kəmstəns] - тедаjүб, вазиjjет.
ferrie - ['ferɪk] - демир.
to include - [ɪn'klu:dj] - дахил етмек.
to occur - [ə'kə:] - баш вермек, охмаг.
to impart - [ɪm'pa:t] - бөлүшдүрмек, jajмаг.
property - ['prɔpətɪ] - хасса, хүсусиjjет.

to render -[ˈrendə] - көстәрмәк, чевирмәк, һазырламаг.
saline -[səˈlain]- дуз, дуз көлү.
to decrease -[ˈdiːkriːs] - азалтмаг.
hydrated salt-[haidreitid]- һидратлы дуз.
steam boilers-[stiːm bɔiləz]- бухар газанлары.
hard water -[haːd ˈwɔtə] - чод су.
hardness -[ˈhaːdnɪs] - бәрклик, мәһкәмлик.
is due to -[ɪz djuː tə] - һесабына, малы, мәли.
permanent -[ˈpəːmənənt] - һәмишәлик, даими.
soft water -[sɔft wɔːtə] - јумшаг/гајнанмыш/ су.
suitable -[ˈsjuːtəbl] - ујгун, мүнасиб.
peat -[piːt] - торф.
to percolate -[ˈpəːkəleit] - елəмək, сүзмək.
halogen -[ˈhælɔudʒen]- һаллокен.
spring -[sprɪŋ] - булаг.
well -[wel] - гују /су/.
weight -[weɪt] - чəки, ағырлыг.
flocculent -[ˈflɔkjuːlent]- һисə-һиссə, парча-парча.
purification -[ˌpjuərɪfɪˈkeɪʃən]- təмизлəнмə.
objectionable-[əbˈdʒekʃnəbl] - хоша кəлмəјəн, наразылыг төрəдəн.
available -[əˈveɪləbl] - мүнасиб, јарарлы.
to locate -[lɔuˈkeɪt] - јерлəшмək,ашкар етмек.
to combine -[ˈkɔm bain] - бирлəшдирмək.
agent -[ˈeɪdʒənt] - реакент,маддə.
emulsion -[ɪˈmʌlʃən] - емулсија.
grease -[griːz] - јаг, јағламаг, маз.
glutinous -[ˈgluːtɪnəs] - хелатинли, јапышганды.

aeration -[ˌeɪəˈreɪʃən] - һавалы дәйшмә..., газ бурахма.
spray -[spreɪ] - су ахыны, сызма.
trickle -['trɪkl] - ахын.
to accelrate -[æk'seləreɪt] - тезләшдирмәк.
to escape - [ɪs'keɪp] - гачмаг, сүрүшмәк, чыхмаг.
bacteria - [bæk'tɪərɪə]- бактерија, микроб.
frequently -['fri:kwəntlɪ]- тез-тез, адәтән.
effluent - ['efluənt] - ахын, чајын голу.
municipal -[mju:'nɪsɪpəl]- коммунал,өзүнүнкүдарә,муниси-пиал.
ozone - ['ouzoun] - озон.
copper - ['kɔpə] - мис.
aluminium -[ˌæljʊ'mɪnjəm]- алуминиум.
ferrous - ['ferəs] - дәмир.
gelatinous -[ˌʤelə'ti:n]-желатин, јапышган/лы/.
softening - ['sɔfnɪŋ] - јумшалмаг.
feed-water -[fi:d wɔ:tə]- ичмәли су.
flue-gases -[flu:'gæsɪs]- учан газлар.
economizer -[i:'kɔnəmaɪz]- гәнаәтчи.
decompozition -[ˌdi:kɔmpə'zɪʃən]- дағылма, чүрүмә.
to decompoze -[ˌdi:kəm'pouz] - дағылмаг, чүрүмәк.
preferable - ['prefərəbl] - үстүн тутулан.
milk of lime -[mɪlk ɔv laɪm]- әһәнк суду.
to slake - [sleɪk] - сөндүрмәк, өлдүрмәк.
deleterious -[ˌdelɪ'tɪərɪəs]- зәрәрли.
suitable - ['sju:təbl] - үјгун, мүнасиб.
filter-press -['fɪltə pres] - сүзкеч пресс.

EXERCISES

I. Translate and put questions(general and special questions)

1. No one can think about the life without getting water. 2. Dissolved gases may comprise two groups. 3. Oxygen may be removed by passing the water over metallic iron. 4.The soluble crystalloids include most of the impurities occuring in natural waters. 5.The presence of these substances in greater or less amounts imparts to the water. 6.Hard water contains salts of calcium, magnesium. or iron. 7.Soft water usually contains very little mineral matter. 8.Alkaline waters are high in carbonates and sulphates. 9.The quality of the water available should be considered in locating the works. 10.These are the substances which cause the more difficulty in technical work, and especially when the water is used in steam boilers. 11.Colloidal substances have very large molecular weight. 12.Bacteria and other organism are frequently destroyed in sewage effluents.

II. Chose one of the suggested topics and write a report

1. The Soviet Programme for World Peace
2. The writer whom I like best
3. About the natural resources of Azerbaijan
4. About the chemical plants in Sumgait
5. Your wish in chemistry
6. The living standard of Soviet man
7. Chemistry in future
8. About the different fields of organic chemistry

S A L T

There are the following salt sources in the world :

1. Sea water.
2. Rock salt.
3. Salt brines derived from springs, lakes, or wells.

Atlantic sea water, except near the mouths of large rivers , averages about 3.4 per cent of solid matter, of which about 75 per cent is sodium chloride, the remainder consisting of chlorides, bromides, and sulphates of potassium, calcium, lithium, etc., with minute amounts of other salts.

The concentration of sea water for salt is carried on to some extent in warm, dry countries by solar evaporation, the water usually being exposed in shallow tanks or ponds to the sun's rays. Sea water is seldom evaporated over fire because of the cost of fuel. In Russia it is allowed to freeze over the surface, and the ice, which contains but little salt, is removed. This is repeated until the brine is sufficiently concentrated to make the evaporation over fire profitable. Salt made from sea water ("sea salt") is coarse and is usually damp, owing to the presence of some magnesium chloride, which, being a deliquescent substance, attracts moisture from the air. It is of less importance in this country than that made from other brines.

Rock salt is found in many countries, and often very pure. In England, Austria, Germany, Spain, and Louisiana are large deposites, some so pure that it is only necessary to grind it for use,

but in most cases it is contaminated with iron oxides, clay, sand, and other impurities, which often necessitate its purification. In this country is mined in New-York, Kansas, (Kansas), Utah, and Louisiana. As it does not dissolve so readily as finely crystalized salt, it is preferred for many purposes, such as curing meat, preserving green hides, and feeding to live stock.

The salt of principal interest in this country is derived from natural brines, found chiefly in New York, Michigan, Kansas, and Ohio, while West virginia, Utah, Texas, and Pennsylvania produce lesser quantities.

The New York deposit are near Syracuse and in the neighbourhood of Warsaw and Batavia. The Onondage (Syracuse) deposit has been known since the middle of the seventeenth century, but that at Warsaw, opened in 1883, is now the most important. The michigan deposita are near Seginaw Bay and Manistes, a strong brine being obtained by boring, large amounts of brine are evaporated near Salina, Kansas. The Ohio and West Virginia deposits are inthe valley of the Ohio River, near pomeroy and Wheeling.

Brines are obtained by board wells, 8 inches in diameter, similar to those for petroleum. The wells are lined with iron casings to exclude water from the over-lying strata. The brine as it comes from the well has some turbidity, due to clay or fine sand, together with minute bubbles of carbon dioxide, with which the brine is usually charged. Ferrous carbonate is also held in solution by the carbon dioxide, and on exposure to the air a yellowish red precipitate of ferric hydroxide separates. This is usually hastened by adding "milk of lime", or soda-ash, which also throws out some of the calcium or magnesium salts from the brine.

WORDS AND EXPRESSIONS

salt source -[sɔ:lt sɔ:s] - дуз мәнбәи.
rock salt -[rɔk sɔ:lt] - даш дуз.
salt brine -[sɔ:lt brain] - дуз мәһлулу.
mouth of river -[mauθ əv 'rivə] - чајын башланғычы, мәнбә.
average -['ævərɪdʒ] - орта /өлчү, кәмиjjәт/.
lithium -['lɪθɪəm] - литиум.
shallow tank -['ʃæloutæŋk] - кичик габ, чән.
pond -[pɔnd] - булаг, һовуз.
sun rays -[sʌn reɪz] - күнәш шуалары.
to freeze -[fri:z] - доңмаг, бузлашмаг.
deliquescent -[,dɪlɪ'kwesnt] - һәлл ола билән.
moisture -['mɔɪstʃə] - нәм.
to grind -[graɪnd] - әзмәк, үjүтмәк.
to conteminate -[kən'tæmɪneɪt] - корламаг, jолухмаг.
to necessitate -[nɪ'sesɪteɪt] - мәчбур етмәк.
purification -[,pjuərɪfɪ'keɪʃən] - тәмизләнмә.
To preserve -[prɪ'zə:v] -горумаг, консервләшдирмәк.
green hide -[gri:n haɪd] - тәзә дәри/хаммал/.
stock -['stɔk] - ehтиjат.
valley -['vælɪ] - дәрә, вади.
petroleum -[,pɪ'trouljəm] - нефтолиум, нефт.
iron casing -[aɪən 'keɪsɪŋ] - дәмир өртүк.
over-lying strata -['ouvəlaɪŋ 'streɪtə] - өртүк, габыг.
turbidity -[tə:'bɪdɪtɪ] - буланыглыг, чирклилик.
bubble -[bʌbl] - габар, габарчыг.
to hasten -[heɪsn] - тезләшдирмәк, тәләсмәк.

E X E R C I S E S

I. Put questions (special and general) to the sentences and translate into Azerbaijan

1. There are the following salt sources in the world. 2.The concentration of sea water for salt is carried on to some extant in warm, dry countries by solar evaporation. 3.Sea water is seldom evaporated over fire because of the cost of fuel. 4.This is repeated until the brine is sufficiently consentrated to make the evaporation over fire profitable. 5.Rock salt is found in many countries. 6.The salt of principal interst in this country is derived from natural brines. 7.Brines are obtained by board wells. 8.The wells are lined with iron casings to exclude water from the over-lying strata.

II. Chose the theme and describe it

1. What do you know about the salt ?
2. The main salt deposit in USSR
3. The main salt deposit in Azerbaijan
4. The importance of salt for a living being
5. Salt in everyday life
6. Salt in your chemical laboratory

S U L P H U R

Most of the sulphur used in the industries is derived from the native mineral, which is found in many places, but usually in volcanic regions. It is always impure, being mixed with gypsum, aragonite, slay, or other matter, in the interestices of which the sulphyr is deposited. The formation of sulphur beds may have occored by the reaction of gases, such as hydrogen sulphide and sulphur dioxide, with each other or with oxygen; or by the decomposition of metallic sulphides through the agency of heat; or by the reduction of sulphates, especially of calcium sulphate, which has probably caused the formation of some stratified deposits.

The first is probably the most frequent mode of deposition, and may be observed at the present time in many volcanic districts wherw hydrogen sulphide and sulphur dioxide are escaped. The reactions are the following:

$$SO - 2HS = 2HO - 3S ;$$

$$HS - C = HO - S ;$$

$$HS - 3O = HO - SO .$$

In Lousiana, sulphur is obtainedby the method devised by Hermann, which has been very succesful. Driven wells are sunk into the deposit, which lies at a depth of about 450 feet, and is about 100 feet thick. In each well are four concentric lines of pipe, rnning in diameter from 10 inches to 1 inch. Superheated water is forced down between the 10-inch and 6-inch pipes, and passing into the crevices of the sulphur-bearing rock, melts the

sulphur, which runs into the sump at the foot of the well. Through the I-inch pipe, compressed hot air is forced to the bottom of the well, where it mixes with the melted sulphur, forming an aerated mass, which the water and air pressure cause to rise through the 4-inch pipe, to the surface; the mixture of melted sulphur, hot water, and air is discharged into large open vats made of boards.

The chief uses for crude sulfur are: for combating sodium tuckeri, a fungus causing the vine disease (this disposes of a large part of the yearly production) ; for making sulphuric acid; for sulphurous acid and bisulphite solutions; for carbon disulphide; and for making ultramarine. Refined sulphur goes mainly for gunpowder, matches, and for vulcanizing rubber.

Sulphur melts at 115-120 c., and has a special gravity of I.98-2.04 ; it is a poor conducter of heat and electricity, dissolves easily in carbon disulphide, and less readily in chloroform, benzol, turpentine, and other oils.

WORDS AND EXPRESSIONS

sulphur - ['sʌlfə] - сулфур.
gypsum - ['dʒipsəm] - кипс.
aragotite - [ˈ æragotait] - .
slay - [sleI] -
sulphur bed - ['sʌlfə bed] - сулфур датагы.
to stratify - ['straetifai] - jajылмыш.
inch - [Intʃ] - дюм / 2,5 см/. елчу.
super heated - ['sju:pə'hi:tid] - чох гыздырылмыш.
crevice - ['krevIs] - чат, jарыг.
sulphur-bearing rock - ['~'bearIŋ rɔk] - сулфурлу даш/raja/.

sump - [sʌmp] - јува/маддәнин топлашмасы үчүн/.
compressed - [kəm'prest] - сыхылмыш, сых.
to force - [fɔ:s] - сыхмаг, мүгавимәт кестәрмәк.
to the bottom of the well - [bɔtm] - гујунун дибинә.
aerated mass - ['eiəreitid mæs] - газ гарышыг маддә, смес.
to discharge - [dis'tʃa:dʒ] - бошалтмаг, азад етмәк.
vat - [væt] - габ, чән, систерн.
crude sulfur - [kru:d sʌlfə] - чиј/нәм, јетишмәмиш/ сулфур.
to combat - ['kɔmbət] - вурушмаг, тоггушмаг.
fungus - ['fʌngəs] - киф.
vine disease - [vain di'zi:z] - үзүм/шәраб/ хәстәлији.
ultramarine - ['ʌltrəmərin] - ултрамарин.
refined sulphur - [ri'faind sʌlfə] - тәмизләнмиш сулфур.
gunpowder - ['gʌnpaudə] - барыт.
match - [mætʃ] - кибрит.
vulcanizing of rubber - [vʌlkənaizin] - резинин үфүрүлмәси.
chloroform - ['klɔrəfɔ:m] - хлороформ.
benzol - ['benzɔl] - бензол.
turpentine - ['tə:pəntain] - скибидар.

EXERCISES

I. Put questions to the sentences(general and special questions)

1.Most of the sulphur is used in the industries is derived from the native mineral. 2.The first is probably the most frequent mode of deposition. 3.In Lousiana, sulphur is obtained by method devised by Hermann, which has been very successful. 4.In each well are four concentric lines of pipe. 5.Super heated water

is forced down between the 10-inch and 6-inch pipes. 6.Refined sulphur goes mainly for gunpowder,matches and for vulcanizing rubber. 6.Sulphur melts at 115-120 c. and has a specific gravity.

II. Answer the questions

1. Which day of the day you like best? 2.Which day of the week don,t you like at all? 3.Which day of the week is Saturday? 4. With whome is the story of the discovery of chemical energy connected? 5.What did people think of chemistry first? 6.What does a person do when he loses his way in a vast forest? 7.HOW can a person find his way at sea if the weather is clear?

III. Мевзулардан бирини сеч вә тәсвир ет/инкилисче/

1. Д.И. Менделејев кимјанын банисидир.
2. Инглабдан әввәлки кимја сәнајеси
3. Инглабдан сонракы кимја сәнајеси
4. Сумгајыт мүасир кимја шәһеридир.
5. Фосфорлу күбрәләр вә онларын к/т-да әһәмијјәти

S U L P H U R D E R I V A T I V E S

Sulphur dioxide (SO) is the most important sulphur compound and is made on a large scale by roasting iron pyrites for the sulphuric acid manufacture: for producing smaller quantities of sulphur dioxide direct combustion of brimstone is customary.

Much sulphur dioxide is produced in the roasting and smelting of copper and lead ores and recently attention has been given to the condensation of these fumes for the making of acid or other purposes, but chiefly with the object of abating the nuisance and damage they cause in the surrounding country.

Pure sulphur dioxide is made by dissolving the crude gas from sulphur burners in water by use of counter-current washing towers, and recovering it from the solution by heating. The gas is dried, compressed to liquid , and put on the market in steel cylinders.

Sulphur dioxide is used for making sulphuric acid; for the acid sulphite liquor used in making wood pulp; for preparing sodium bisulphite as a bleaching agent for wood, hair, straw, and other tissues ; as a disinfected and germicide; and in the liquid state in ice machines.

Substances such as wool and straw, when bleached by exposure to sulphur dioxide gas, slowly regain their original color on exposure to the light. The coloring matter is not destroyed, but probably unites with the sulphur dioxide to form a colorless compound, which slowly decomposes.

Sodium bisulphite (NaHSO) is formed by saturating sodium

carbonate solution with sulphur dioxide:

$$Na\ CO - H\ O - 2SO = 2\ NaHSO - CO$$

it forms a strong-swelling solution occasionally used as an "antichlor" to remove excess of chlorine from the fibres of bleached cotton or linen goods. Its reaction is probably follows:

$$Ca(CLO) - 2\ NaHSO = 2\ NaCL - CaSO - H\ SO\ ;\ \text{or,}$$

$$= Na\ SO - CaSO - 2\ HCL;$$

$$2\ CL - NaHSO - H\ O = NaCL - H\ SO - HCL\ ;\ \text{or}$$

$$= NaHSO - 2\ HCL.$$

It also finds some use in other industries, such as chrome tannage, brewing, glucose and starch making. The solution of bisulphate decomposes on evaporation, giving off part of the sulphur dioxide, and forming neutral sulphite of sodium.

Calcium bisulphite ($CaH(SO)$) is made by passing sulphur dioxide into milk of lime. It is probably a solution of neutral sulphite in an excess of aqueous sulphurous acid. It is used in much the same way as the sodium salt.

WORDS AND EXPRESSIONS

derivative	-[dɪ'rɪvətɪv]	- дүзәлтмә.
copper	-['kɔpə]	- мис.
lead ore	-[lèd ɔ:]	- гурғушун (илизи.
nuisance	-['nju:sns]	- дарыхдырычы, хоша кәлмәјән.
damage	-['dæmɪdʒ]	- зәрәр, чәримә.
crude gas	-[kru: d-]	- гарышыг газ.
counter-current	-['kauntə'kʌrənt]	- әкс ахын.

washing tower – [ˈwɔʃɪŋ ˈtaʊə] – јујучу гүлләе.
market – [ˈmɑːkɪt] – базар, гијмәт, тичарәт.
steel cylinder – [stiːl ˈsɪlɪndə] – полад силиндир.
wood pulp – [wud pʌlp] – **ағач күтлә.**
bleaching agent – [ˈbliːtʃɪŋ ˈeɪdʒənt] – ағардычы маддә.
straw – [ˈstrɔː] – бөш, күләш.
tissue – [ˈtɪsjuː] – парча, материал.
disinfectant – [dɪsɪnˈfektənt] – дезинфексијаедичи.
germicide – [ˈdʒɔːmɪsaɪd] – бактерија өлдүрүчү.
ice machine – [aɪs məˈʃiːn] – буз машыны.
exposure – [ɪksˈpouʒə] – горунмајан.
original color – [əˈrɪdʒənl] – тәбии рәнк.
colorless compound – [ˈkʌlərlɪsˈkɔmpaund] – рәнксиз тәркиб.
saturating sodium – [ˈsætʃəreɪtɪd ˈsoudjəm] – hопдурулмуш сода.
strong-smelling solution – [strɔŋˈsmelɪŋsəˈluːʃən] – күчлү гоху верән маддә.
antichlor – [ˈæntɪklɔː] – әнтихлор.
bleached cotton – [bliːtʃd ˈkɔtn] – ағардылмыш памбыг.
linen goods – [ˈlɪnɪn gudz] – кәтан маддәләри.
in **chrome tannage** – [kroumˈtʌnɪdʒ] – хром сахланмасында.
brewing – [bruːɪŋ] – гајнама/пијвә, шәраб/.
glucose – [ˈgluːkous] – глукоза, шәкәр.
in **starch making** – [ˈstɑːtʃ meɪkɪŋ] – крахмал hазырланмасында.
aqueous – [ˈeɪkwɪəs] – сулу, чөкүнтүлү.
productivity – [ˌprɔdʌkˈtɪvɪtɪ] – мәнсулдарлыг.
prohibit – [prəˈhɪbɪt] – гадаған етмәк.
measuring flask – [ˈmeʒərɪŋ flɑːsk] – өлчү габы.
speed counter – [spiːdˈkauntə] – сајғач.

EXERCISES

I. Translate into Azerbaijan and put questions (general and special questions)

1.Sulphur dioxide is the most important sulphur compound and is made on a large scale by roasting iron pyrites for the sulphuric acid manufacture. 2.Much sulphur dioxide is produced in the roasting and smelting of copper and lead ores. 3.The gas is dried, compressed to liquid. 4.The coloring matter is not destroyed. 5. Sodium bisulphite is formed by saturating sodium carbonate solution with sulphur dioxide. 6.Sodium is an important chemical substance. 7.It is used in much the same way as the sodium salt.

II. Chose one of these themes and compose a report

1. What chemical matter you know best ?
2. Our chemical industry before the October Revolution
3. The most important chemical city in our country.
4. The most prominent Azerbaijan chemist

III. Translate into azerbaijan /No Friends/

An officer stops a new soldier.

"Why aren't you saluting me."

"I am yet new in this place here, sir, and haven't yet made any acquaintance."

/He didn't Look Back/

A vet back from war was asked:"Did you see an enemy?"

"No, he answered, "I didn't look back. "

S U L P H U R I C A C I D

Sulphuric acid is probably the most important of all chemicals, because of its extensive use in a very large number of manufacturing operations. Of the immense quantities made yearly, the greater part does not come upon the market; for being expensive and difficult to ship consumers of large amounts generally make their own acid.

The commercial grades of acid have special names. A moderately strong acid, such as condenses in the lead chambers, is known as "chamber acid". It contains from 62 to 70 per cent of H_2SO_4, and is strong enough for use in the manufacture of fertilizer, and for other purposes requiring a dilute acid. By consentrating this chamber acid is obtained, containing about 78 per cent of H_2SO_4, which is sufficiently strong for most technical uses. Further evaporation in platinium or iron pans yields an acid of 66 Be., containing 93.5 per cent of H_2SO_4, and known as oil of vitriol, while the strongest acid that can be made by direct evaporation contains about 98.5 per cent of H_2SO_4, and is called monohydrate. Fuming is still more concentrated, is prepared by special urans, and it is essentially a solution of sulphuric anhydride (SO_3) in sulphuric acid;

Sulphuric acid is now made by two important methods : the old chamber process yielding dilute chamber acid directly, and the newer contact processes yielding sulphuric anhydride (SO_3) as first product, from which any desired strength of sulphuric acid may be made by dissolving in weak acid or water.

For producing consentrated acid the contact method has proved generally more economical, and is slowly displacing the old chamber process with its concentrating plant.

WORDS AND EXPRESSIONS

extensive -[ɪks'tensɪv] - һертәрәфли, бөјүк.
immense quantity-[ɪ'mens'kwɔntɪtɪ]- бөјүк мигдарда.
consumer -[kən'sju:mə] -- тәләб едән,сифаришчи.
commercial -[kə'mə:ʃəl] - тичарәт.
moderately -['mɔdərɪtlɪ] - инамлы,еһтибарлы.
lead chamber -[led 'ʧeɪmbə] - гурғушун камера.
chamber acid -[ʧeɪmbə 'æsɪd] - камерада һазырланан туршу.
fertilizer -['fə:tɪlaɪzə]- күбрә.
dilute acid -[daɪ'lju:t æsɪd]- дурулашдырылмыш туршу.
platinium -[plætɪnəm] - платин.
iron pan -['aɪən pæn] - дәмир таб.
oil of vitriol -[ɔɪl ər'vɪtrɪəl]- купарос јағы/мәһлуҗу/.
monohydrate -[mɔnə'haɪdreɪt]- моно/тәк/һидрат.
uranium -[juə'reɪnjəm]- уран.
essentially -[ɪ'senʃəlɪ] - јәриндә, мәгсәдәујғун.
newer -[nju:ə] - нисбәтән/даһа/ јени.

EXERCISES

I. Put questions to the sentences and translate into Azerbaijan

1.Sulphuric acid is probably the most important of all chemicals, because of its extensive use in a very large number of

manufacturing operations. 2.The commercial grades of acid have special names. 3.It contains from 62 to 70 per cent of H SO, and is strong enough for use in the manufacture of fertilizer. 4. Fuming is still more consentrated and is proved by special urems. 5.Sulphuric acid is now made by two important methods. 6. For producing consentrated acid the contact mehted has proved gemerally more economical.

II. Chose the themes and compose a report

1. What kind of fertilizer do the cotton growers use in cotton fields now ?
2. What do you know about the fertilizer producing plants ?
3. Where do we use sulphuric acid ?
4. At the chemical laboratory
5. About the chemical imdustry in abroad

THE SODA INDUSTRIES

Nearly all the soda of trade was formerly obtained from certain natural deposits of the so-called "sesquicarbonate", or from the ashes of sea plants. But towards the end of the 18th century, the supply from these sources became insufficient to meet the increasing demands. About 1775 the French Academy of Sciences offered a large prize for a method of making soda from salt. Among other processes submitted was one by Nicolas Leblanc, which seemed promising, and being granted a patent in 1791, he began manufacturing on a commercial scale. But in the French Revolution his factory was seized the patent declared public property, and no indemnity was paid to him. Having lost all his property, he finally committed suicide.

The reactions of the Leblanc process are generally expressed as follows :

1) $2\ NaCl + SO_4 = Na_2SO_4 + HCl$

2) $Na_2SO_4 + 2\ C = Na_2S + 2\ CO_2$

3) $Na_2S + CaCO_3 = Na_2CO_3 + CaS$

4) $CaCO_3 + C = CaO + 2\ CO$

But these equations do not represent all the reactions which take place during the process, for a number of other substances are formed. The first equation represents the preparation of sodium sulphate and hydrochloric acid. The second and third reactions are realised in one operation.

WORDS AND EXPRESSIONS

soda - [ˈsoudə] - сода.
sesquicarbonate - [ˈseskwiˈkaibənit] - ярым карбонат.
the ashes of sea plants - [ðə æʃiz əv ...] - дениз биткилери кулу.
insufficient - [ˌinsəˈfiʃənt] - аз, чатышмаjан.
increasing demand - [inˈkriːsiŋ diˈmaːnd] - артан телабат.
to offer - [ˈɔfə] - теклиф етмек.
submitted - [səbˈmitid] - кешф олунмуш.
seemed promising - [siːmd ˈprɔmisiŋ] - теклиф едилене охшаjырды.
patent - [ˈpeitənt] - патент, херч.
to declare - [diˈklɛə] - е'лан етмек.
commercial scale - [kəˈməːʃəl skeil] - тичарет планы.
was seized - [wɔz siːzd] - тутулду.
public property - [pʌblik ˈprɔpəti] - ичтимаи мулкиjjет.
no indemnity - [inˈdemniti] - hеч бир херч.
to commite suicide - [kəˈmitˈsjuːsaid] - езуну елдурмек.

E X E R C I S E S

I. Copy out the following reactions and write them as you read
(for ex: AL(OH)$_3$ - Mg ...aluminum hydrate plus magnesium)

1. 2 NaCL + H SO = Na SO - HCL
2. Na SO - 2 C = Na S - 2 CO
3. Na S - CaCO = Na CO - CaS
4. CaCO - C = CaO - 2 CO

II. Describe the method of getting NaCL in laboratory condition and write a composition

Calcination - is the process of subjecting a substance to the action of heat, but without fusion, for the purpose of causing some change in its physical or chemical constitution. The objects of calcination are usually : (I) to drive off water, present as absorbed moisture, as "water of crystallisation", or as "water of constitution" ; (2) to drive off carbon dioxide, sulphur dioxide, or other volatile constituent; (3) to oxidize a part or the whole of the substance.There are a few other purposes for which calcination is employed in special cases, and these will be mentioned in their proper places. The process is often called "roasting", "firing", or "burning", by the workmen. It is carried on in furnaces retorts, or kilns, and the material is often raked over or stirred, during the process, to secure uniformity in the product.

The furnaces used for calcining substances vary much in their construction, but there are three general classes: reverberatory, muffle, and shaft furnaces or kilns.

WORDS AND EXPRESSIONS

calcination	-[ˌkælsɪ'neɪʃən]	- гыздырыпма,
to subject	-[səb ʤekt]	- табе етмек, кеше етмек.
action of heat	-['ækʃən əv hi:t]	- истинин феаниjjети.
fusion	-['fju:ʒən]	- ерите.
constitution	-[ˌkɔnstɪ'tju:ʃən]	- физики гурулуш.
to drive off	-[draɪv]	- чыкармаг, кенар етмек.
absorbed moisture	-[əb'sɔ:bd]	- нем чекиши.
sulphur dioxide	-['sʌlfə]	- сулфур диоксид.
to mention	-['menʃən]	- реjд етмек.
roasting	-['roustɪŋ]	- гыздырыпма, jандырыпма.

firing -[ˈfaɪərɪŋ] - јандырыма, гыздырма.
burning -[ˈbɜ:nɪŋ] - јанма.
furnace -[ˈfɜ:nɪs] - печ, очаг јери.
retort -[rɪˈtɔ:t] - говмаг/маддени/.
kiln -[kɪln] - јандырмаг вә гурутмаг үчүн печ.
to rake -[reɪk] - гарышмаг, јығмаг, дүзәлтмәк.
to secure -[sɪˈkjuə] - тәһлүкәсиз етмәк.
uniformity -[ˌju:nɪˈfɔ:mɪtɪ] - тәк, ајрыча.
to calcine -[ˈkælsaɪn] - гыздырмаг.
construction -[kənˈstrʌkʃən] - гурғу, конструкција.
reverberatory -[rɪˈvɜ:bərətərɪ] - әкс етдирән.
muffle -[ˈmʌfl] - бүкмәк, сарымаг.
shaft furnace -[ʃa:ft ˈfɜ:nɪs] - вал, ос, дәстәк.

EXERCISES

I. Put questions to the sentences(general and special questions)

1. Calcination is the process of subjekting a substance to the action of heat. 2.The objects of calcination are usually present as absorbed moisture. 3.There are few other purposes for which calcination is employed in special cases. 4.These will be mentioned in their proper places. 5.It is carriedOon in furnaces:retorts. 6.The furnaces used for calcining substances vary much in their construction. 7.There are three general classes and shaft furnaces or kilns. 8.Calcination is very important chemical process in our industry today.

II. Write a descriptive sketch forsany of the following:

1.Your eldest or youngest relative;

2. A hero of the Soviet Union.

OPTICAL GLASS

Glass which is to be used for lenses must be almost colorless, freefrom defects. These requirements mean that optical glass must be stirred for a long time in the melting pot, and cooled very slowly during a period of 5 or 6 days.

In the modern optical glasses a part or all of the silica of otdinary glass is often replaced by boric oxide (B_2O_3) or phosphoric oxide (P_4O_{10}) and part or all of the lime and soda by the oxides of barium, Zinc, Magnesium, or even aluminium.

Great progress has lately been made in developing special glasses that are more transparent than ordinary glass to ultra - violet light. Such glass must be particularly free from iron, and sometimes contains beryllium oxide (BeO) instead of lime. Glass of this type is used in the bulbs of "sun ray" lamps, and sometimes on hospital windows, when the therapeutic properties of the ultra-violet part of the sun's rays are to be tested.

WORDS AND EXPRESSIONS

optical glass - [ɔ́ptɪkəl glɑ:s] - оптик шуше.
is to be used - [ju:zd] - истифаде едилир.
colorless - ['kʌlələs] - ренксиз.
requirement - [rɪ'kwaɪəmənt] - телабат, тələб.
to cool - [ku:l] - соjутмаг.
ordinary glass - [ɔ́:dnrɪ glɑ:s] - адн шуше.
to replace - [rɪ 'pleɪs] - jеринн дəjишмек.
melting pan - [melting pæn] - эритме чəни.

transparent -[trænsˈpɛərənt] - ачыг, ајдын.
ultra violet light -[ˈʌltrəˈvaɪəlɪt] - ултра бәнөвшәји шуа.
beryllium - [bəˈrɪljəm] - бериљум.
bulbs of sun-ray-[bʌlbsəvsʌn reɪ] - күнәш шуасы дәстәләри.
hospital windows -[ˈhɔspɪtl windou]- хәстәхана пәнчәрәләри.
therapeutic -[ˌθerəˈpju:tɪk] - терапевт/ија/.
to test - [test] - јохламаг, сынамаг.

EXERCISES

I. Answer the questions in affirmative and negative

1. What kind of glasses do we use for lenses? 2. Can we use glasses for lenses with some defects? 3. Are there any diferences between the glases for lenses with other glases? 4. What do these requirements mean? 5. What must be stirred for a long time in the melting pot? 6. What has lately been made in developing spe - cial glasses? 7. Where has lately been made great progresses? 8. What must be particularly free from iron? 9. What kind of glass is used in the bulbs of "sun ray" lamps?

II. Chose the theme and describe :

1. About the birth of the glass in the world
2. Glass in our everyday life
3. Glass in hous building
4. Glass in medicine
5. About the raw materials by which we make glass

SOME SPECIAL KINDS OF GLASS

The soft glass of window panes, bottles, and electric light bilbs is shaped by blowing with compressed air in automatic machines, which produse these articles at a light speed, with very little aid from human hands.

Plate glass is made by rolling a pasty mass of glass, afterward annealing and polishing.

Colored glass usually owes its color to metallic oxides (of copper,cobalt, manganese , etc.). These oxides, of course, combine with the silica to form silicates. Cobalt oxide gives a blue color; selenium dioxide or gold - a ruby-red; cupric oxide - a blue under oxidizing conditions, or a dull red, under reducing conditions; chromium trioxide - a green; silver oxide - a yellow; manganese dioxide - a violet.

Safety glass or shatter-proof glass consists of two thin sheets of plate glass, cemented with a layer of organic plastic material. The sheets are pressed together, sometimes in a partial vacuum, at a temperature sufficient to soften the organic plastic and create a permanent bond between the two sheets of glass.

WORDS AND EXPRESSIONS

pane - [p e ɪ n] - пенчәре мүшәси.
bottle - [' b ɔ t l] - бутылка.
bulb - [b ʌ l b] - ишыг лампасы.
to shape - [' ʃ e ɪ p] - форма да салмак.
to blow - [b l o u] - үфүрмәк.

by rolling - [baɪ 'roʊlɪŋ] - фырлама јолу илә.
pasty - ['peɪstɪ] - күндәвари.
annealing - [ə'ni:lɪŋ] - гыздырмаг, јандырмаг.
polishing - ['pɔlɪʃɪŋ] - төмизләмә, чилалама.
colored - ['kʌləd] - рәнкли.
to owe - [oʊ] - сабиб олмаг, үстүн көлмәк.
selenium - [sɪ'li:njəm] - селен.
ruby-red - ['ru:bɪ red] - рубин, гырмызы корунд.
cupric - ['kju:prɪk] - мис.
dull red - [dʌl red] - туттүн гырмызы.
violet - ['vaɪəlɪt] - бәнөвшә, бәнөвшәји.
safety - ['seɪftɪ] - тәһлүкәсизлик.
shatter-proof - ['ʃætə'pru:f] - сынмаја давамлы.
sheet - [ʃi:t] - дөвһә, лај, төбәгә.
to soften - ['sɔfn] - јумшалтмаг.
bond - [bɔnd] - әлагә, мүнасибәт.

EXERCISES

I. Answer the questions in negative and positive :

1. How is shaped the soft glass of window panes, bottles, and electric light bulbs? 2. What is made by rolling a pasty mass of glass? 3. What kind of glass is made by rolling a pasty mass of glass? 4. Why does the colored glass is usually owes its color to metallic oxides? 5. What oxide gives a blue color? 6. What are pressed together? 7. What consists of two thin sheets of plate glass?

II. Translate into Azerbaijan(Goes Without Saying)

At the naval recruiting center an applicant was asked:
" So you want to join to the Navy, Smith? Can you swim?"
"Yes."
" And where did you learn to swim ? "
" What do you mean where?" "In water, of course!"

(Standard Remedy)

During the Second World War the doctor asked a sick sailor: "Did you try to gargle your throat with sea water?"
" Sea water?" exclaimed the sailor. "I drowned three times."

(Don't Hurry)

A new ship radio operator was told by the captain:
" Quisk, operator, send a SOS!"
" How do you spell it?"

THE AMMONIA SODA PROCESS

The ammonia soda process depends upon the fact that sodium bicarbonate is but slightly soluble in a cold ammonical solution of comman salt. The technical success of the process depends chiefly on the proper regulation of the temperature during the precipitation, and on the capacity of the works to handle large quantities of gases and liquids. As far as possib le, manual labour must be avoided, and the products moved and treated in solution or suspension. The reactions are as follows :

I) $NaCL - NH - H\,O - CO = NH\,CL - NaHCO$

2) $2\,NH\,CL - Ca(OH) = CaCL - 2\,H\,O - NH$

The first equation is the chief one ; the second represents the recovery of the ammonia, and is essential to the commercial succes of the process.

The salt is used as a very consentrated brine, which has been purified from iron, sillica, magnesia, etc.; it is then saturated with ammonia gas, obtained from gas liquors, or by the recovery process according to equation. The carbon dioxide is obtained partly from lime kolns and partly from the calcination of the bicarbonate to form the normal carbonate. It must be contained at least 30 per cent of CO, and is prepared in special forms of continuous lime kilns. The lime resulting is used in the recover- of the ammonia (reaction 2) and for making caustic soda.

WORDS AND EXPRESSIONS

slightly soluble-[ˈslaɪtlɪ ˈsɔljubl] - асан ныхас онаж.
succes -[sakses] - муваффагиjjет.
manual labour -[ˈmænjuəl ˈleɪbə] - ем емеjм/мин/.

suspension	-[səs'penʃən] - дажандырыма .
consentrated	-['kɔnsentreitid] -консентре едилмиш.
silica	-['silikə] - силикат, гум.
lime kiln	-[laim kiln]- ѳһенк печи.
calcination	-[kælsinei∫ən] - жандырыма.
caustic soda	-['kɔ:stik'soudə] - каустик сода.

EXERCISES

I. Put questions (general and special) to the sentences

1. The ammonia soda process depends upon the fact that sodium bicarbonate is but slightly soluble in a cold ammonical solution of comman salt. 2.The technical success of the process depends chiefly on the proper regulation of the temperature during the precipitation. 3.The salt is used as a very consentrated brine, which has been purified from iron, silica, etc. 4. The carbon dioxide is obtained partly from lime kilns and partly from the calcination of the bicarbonate to form the normal carbonate.

II. Chose the theme and describe it in written form

1. Getting of Ammonia Soda in laboratory condition
2. The use of Ammonia Soda in agriculture
3. The use of Ammonia Soda in industry
4. Other substances in preparation of Ammonia Soda

CERAMIC INDUSTRIES

Ceramic comprises the arts of shaping wet clay. The shaping is followed by drying and firing in kilns.

The following products may be included: bricks, pottery including stoneware and porcelain enamel which contains a small amount of clay and others.

A plastic clay is called a fat clay; a less plastic one a lean clay.

In general, the lower the proportion of clay the weaker the article; the more the plastic the clay the harder and stronger the article after drying.

Clays in general have been formed from rock decomposition by various agencies through time. If the clay remains at the original location, it is usually white, and with a low content of iron; it is called kaolin or china clay. Kaolins are the product of the weathering of feldspar, either potash feldspar or soda feldspar, the alkali is washed away. In general most of the clays other than white clays are of secondary origin. The purer deposits of the secondary clays are more plastic than china clay and are used under the name of ball clays.

WORDS AND EXPRESSIONS

ceramics -[sɪ'ræmɪks] - керамик, сахсы.
clay -[klеɪ] - кил.
firing -['faɪərɪŋ] - јандырылма.
kiln -[kɪln] - јандырма печи.
incline -[ɪn'klaɪn] - мејил, әјлəм.

brick - [brɪk] - кәрпич.
pottery - ['pɔtərɪ] - кил габ, кил иши.
stoneware - ['stounwɛə] - кил габ, кил мәмулат.
porcelain - ['pɔ:slɪn] - фарфор.
enamel - [ɪ'næməl] - әмал, ширә.
fat - [fæt] - јағлы.
leam - [li:n] - назик, зәриф.
proportion - [prə'pɔ:ʃən] - прапорсија, мүтәнасиблик.
harder - ['ha:də] - бәрк, мөһкәм.
agency - ['eɪdʒənsɪ] - васитә, көмәк тәсир.
location - [lou'keɪʃən] - јерләшмә, сығышма.
kaolin - ['keɪəlɪn] - каолин.
china - ['ʧaɪnə] - фарфор, чини.
weathering-feldspar - ['weðərɪŋ-] - дәвам кәтирмәк.
feldspar - ['feldspa:] - сәһра
potash - ['pɔtæʃ] - поташ.
ball - [bɔ:l] - даирә, чәврә, шар, күрә.

EXERCISES

I. Put questions to the sentences

1. The shaping is followed by drying and firing in kilns. 2. The following products may be included. 3. A plastic clay is called a fat clay. 4. Clays in general have been formed from rock decomposition by various agencies through time. 5. If the clay remains at the original location, it is usually white. 6. The purer deposits of the secondary clays are more plastic.

II. Chose the theme and describe

1. About the birth of the ceramic materials
2. Ceramic materials in our everyday life
3. Ceramic materials in house building
4. The main raw materials by which we get ceramic materials
5. About the ceramic plants in our republic

III. Translate into English

1. Ән гәдим заманларда инсанлар анчаг кил габлардан истифаде едирмишлер. 2. О дөврдә кил габлар hазырлајанмөшhур сәнәткарлар јетишмишдир. 3. Мөшhур кил усталары әввәлчә кил габларын формасыны, сонра исә онун өзүнү hазырлајармышлар. 4. Кил габларын hазырланмасында ән ишлериндән даһа чох истифаде едилир. 5. Керамик габлардан истифаде етмәк чох асандыр. 6. Керамика сәнајеси өлкәмиздә јахын инкишаф етмиш сәнаје саһәсидир. 7. Керамик габлардан бәзәк ишлериндә истифаде едилир. 8. Бир сыра өлкәләрдә керамик габларын истеһсалы Чинлилердән өјрәнилмишдир. 9. Керамика сәнајеси кәләчәкдә даһа да инкишаф етдириләчәкдир. 10. Республикамызда керамик габлар истеһсал едән хејли мүәссисә вардыр. 11. Керамика сәнајеси ишчиләри иллик планы јеринә јетирмишләр.

CEMENTS

The tremendous expansion of the Portland cement industry is due to extensive road-building programs, to the development of reinforced concrete construction, and to the adaptability and uniformity of the material.

Reinforced concrete permits the construction for instance of a horizontal platform bridging the space between two walls, capable of carring heavy loads without other support. Not only walls and piers, but girders of concrete are now freely used. Bridges, piers, tunnels, dams, and canal walls are built of concrete as well as sidewalks, steps, garage and factory floors, and building foundations.

One reason for the almost universal use of Portland cement is the comparative ease of working it, another is the strength, which increases with age; a third is its uniformity, which permits calculations of strength as relible as those made for structural steel.

Portland cement is a greenish-gray powder. Its essential constituents are lime, silica, and alumina, which are combined to form tricalcic silicate, $3CaO.SiO_2$, tricalcic aluminate, $3CaO.Al_2O_3$ and dicalcic silicate, $2CaO.SiO_2$. Tricalcic silicate acts rapidly, forming gelatinous calcium hydrate and gelatinous silica. Tricalcic aluminate acts with the same rapidity as tricalcic silicate, but does not produce a strong bond. Dicalcic silicate acts only after months have passed. The hardening of Portland cement continues for years, and the concrete made from it increa-

setin strength. As time passes, the gelotimous calcium hydrate crystallizes adding a further element of strength.

Portland cement sets under fresh water as well as in air.

WORDS AND EXPRESSIONS

cement - [sɪ'ment] - семент/тикинти материалы/.
tremendous - [trɪ'mendəs] - бөjүк, нәһәнк.
road-building - ['roud'bɪldɪŋ] - jол тикинтиси.
is due to - [dju:] - нәсабына, нетичесиндә.
reinforced concreate - [ˌri:n'fɔ:st 'kɔnkri:t] - суjа давамлы бөтон.
construction - [kən'strʌkʃən] - гурғу, гурашдырма.
adaptability - [ə'dæptə'bɪlɪtɪ] - jарарлылыг, уjғунлашма.
uniformity - [ˌju:nɪ'fɔ:mɪtɪ] - тәк, тәнһалыг.
for instance - [ɪn'stəns] - мисал үчүн.
horizontal - [ˌhɔrɪ'zɔntl] - horизонтал.
platformm - ['plæt fɔ:m] - платформа, сәһне, мejданча.
heavy cloads - ['hevɪ kloudz] - ағыр jүкләр.
pier - [pɪə] - тәрсане.
girder - ['gə:də] - тир, сүтүн, ферма.
tunnel - ['tʌnl] - тунел, jералты jол.
dam - [dæm] - су анбары, бөjүк су jығыны.
sidewalk - ['saɪd'wɔ:k] - пиjада jолу, jолун кәнары.
garage - ['gærɑ:ʒ] - гараж.
comparative - [kɔm'lɑɪəblɪ] - үмидвәричи, инамлы.
relible - ['kɔm'pærətɪv] - мүгаjисәли.
greenish - ['gri:nɪʃ] - кеj, кеjүмтүл
gray - [greɪ] - боз.

powder - [ˈpaudə] - тоз, барыт.
tricalcic - [traiˈkælsik] - калсиум үч.
gelatinous - [ˌdʒiˈlætinəs] - зүлал.
bond - [bond] - дивар, төбәгө.
further - [ˈfə:ðə] - узаг, кәнар.

EXERCISES

I. Translate the sentences into Azerbaijan and put questions (general and special) :

1. The tremendous expansion of the Portland cement industry is due to extensive road-building programs. 2. Portland cement is the comparative ease of working it. 3. Portland cement is a greenish-gray powder. 4. Tricalcic silicate acts rapidly. 5. The hardening of Portland cement continues for years, and the concreate made from it increases in strength. 6. Portland cement sets under fresh water as well as in air.

II . Chose the theme and describe it

1. What do you know about the birth of cement in the world?
2. Cement in hous building
3. Cement in sea and river buidings
4. Cement in our every day life
5. Cement deposits in our republic
6. About the cement producing plants
7. Cement in agriculture buidings

CHEMICAL INDUSTRY

Our industrial chemistry deals with the preparation of products from raw materials, through the agency of chemical change. But there is occasional exception to this defination; for a few industries, depending on strictly mechanical changes, are classed among the chemical industries. Since a sharp line can not be showen between chemical and mechanical technology, a study of the former necessarily involves some consideration of the mechanical appliances and apparatus, by means of which the mechanical reactions are carri - ed out.

The products of chemical industry are exceedingly numerous and varried in character, but comparatively few come into the hands of the mass of the people for direct consumption . Many of them are used only in making other substances, for it is often the case that the finished product, by-product, or waste from one industry becomes the raw material for another, and it rarely hapens that one manufacturer, starting with the raw materials found in nature, produces from them articles for popular use. Thus the chemical industries become a network of interlacing processes, and in considering one it is often difficult to separate it from others.

Furthermore, as competition has become very close in many li - nes, the use which may be by-products and waste is so important, that processes are often carried out with the view of obtaining larger yields or better quality of the by-product, which may have become a source of considerable profit. In a few industries, it might be said that what were originally the by-products are now the chief products.

and main support of these particular industries.

Lixiviation is the process of separating soluble from insoluble substances by dissolving the former in water or some other solvent poured over it. This process is repeated as often as necessary, until the desired amount of soluble matter been removed. Sometimes the mixture is put into baskets, or on gratings, which are suspended in tanks of water. The solution being denser that the solvent sinks to the bottom as it forms, and water comparatively free from dissolved material is thus constantly brought into contact with the substance to be lixiviated. The insoluble substance remains on the grating or in the baskets. When desired, the soluble material may be recovered from the solution be evaporation or precipitation. Extraction is the term usually employed when some solvent other than water is used in lixiviating. Thus we speak of extraction by stem, alcohol, carbon disulphite, etc.

Some Chemical Processes

Evaporation, in a technical sense, denotes the conversion of a liquid into a vapor for the purpose of separating it from another liquid of higher boiling point, or from a solid which is dissolved in it. In the greate majority of cases, the liquid evaporated from water. If the water(or other liquid) evaporated is to be recovered, by vapors are condensed, and the process then becomes one of the distillation.

There are four general methods of evaporation:

I. Spontaneous evaporation in the open air.

2. Evaporation by application of heat directly from a faire to

the vessel containing the liquid.

3.Evaporation by inderect application of heat from the fire,as by means of steam,with or without pressure.

4.Evaporation under reduced pressure.

The first method,by spontaneous evaporation in the open air, is comparatively slow,and requires exposure of very large surfaces of liquid.The time necessary depends upon the temperature and humidity of the air,and the completeness with which the vapors are removed from the surface of the liquid; hot,dry weather,especially if a brisk wind is blowing,evaporates water quite rapidly. This process is only used for the manufacture of salt from sea water,or from natural brines.

The second method,by direct application of heat from a fire, is very largely used in the arts. This may be done in two general ways:

The flames,or hot gases from the fire,are generally allowed to play directly on the bottom of the vessel containing the liquid; or they may pass through flues or pipes,set into the vessel, so that the liquids surrounds them on all sides.

The third method of evaporation,by the use of steam heat,is very often emploued where there is danger of injury to the product by overheating.

a) Jacketed pans or cettles may be used, These are simply double-walled vessels,the steam being admitted between the walls.

b) The steam may be allowed to circulate through coils of pipe,placed inside the vessel,which is sometimes made of wood. The temperature of the liquid depends on the steam pressure; very often exhaust steam is employed.

The fourth method, evaporation in vacuo, is merely a modification or either the second or third method, but is considered separately for convenience. The boiling points of a liquid may be very materially lowered by reducing the pressure within the vessel. Hence, solutions containing substances which would be injured by the heat necessary to boil them under the atmospheric pressure, or liquids boiling at very high temperatures, are evaporated in vacuum pans.

The different forms of apparatus used for vacuum evaporation vary much in their details, but all depend on the prinsiple of reduced pressure.

WORDS AND EXPRESSIONS

to deal(with)- [dɪ:l] - бәһс етмәк.
preparation -[ˌprepəˈreɪʃən]- һазырлыг, тәдарүк.
raw material -[rɔ:məˈtɪərɪəl] - хаммал.
agency -[ˈeɪdʒənsɪ] - тә'сир, гүввә, фактөр.
occasional -[əˈkeɪʒənl] - етәри, тәсадүфи.
exception -[ɪkˈsepʃən] - мүстәсна/һал/, истисна.
strictly -[ˈstrɪktlɪ] - дөгиг, рәсми.
to involve -[ɪnˈvɔlv] - әһатә етмәк, аид олмаг.
consideration-[kənˌsɪdəˈreɪʃən] - фикир, мүзакирә, бахылма/ише/.
exceedingly -[ɪkˈsi:dɪŋlɪ] - чох, фөвгәладә.
comparatively-[kəmˈpærətɪvlɪ] - мүгајисә илә, нисбәтән.
consumption -[kənˈsʌmpʃən] - тәләбат, ихрач етмә.
substance -[ˈsʌbstəns] - маддә.
by-product -[ˈbaɪˌprɔdʌkt] - икинчи дәрәчәли мәһсул.
waste -[weɪst] - итки, чыхар.
manufacturer -[mænjuˈfæktʃərə] - истеһсалчы.

net work - ['net wə:k] - тохума/hөрмə/ ишлəри.
interlacing -[ˌintə:'leisiŋ]- hөрүлмə, тохунма.
to consider -[kən'sidə] - бахмаг, мүзакирə етмək.
bearing -. ['bɛərɪŋ] - əлагə, мүнасибəт, истигамəт.
furthermore -['fə:ðə'mɔ:]- ондан əлавə,савајы.
competition -[ˌkɔmpɪ'tɪʃən]- јарыш, бахыш, мүсабигə.
to carry out -['kærɪ aut] - дашымаг, јеринə јетирмək.
to obtain - [əb'teɪn] - алмаг, əлдə етмək.
yield - [ji:ld] - истеhсал етмək.
quality - ['kwɔlɪtɪ]- кејфијјət, нөв.
source - [sɔ:s] - мənбə.
considerable -[kən'sidərəbl]-хејли, чох, вачиб.
profit - ['prɔfɪt] - кəлир, фајда.
instance - ['ɪnstəns] - мисал, нүмунə,тəсадүф.
originally -[ə'rɪdʒənlɪ] - илкин, оријинал.
support - [sə'pɔ:t] - үстүн тутма, төрəфини тутма.
particular -[pə'tɪkjulə]- хүсүсиlə, детал, төфсилат.
lixiviation -[lɪksɪvɪeɪʃən] -
to separate -['sepəreɪt] - ајырмаг.
soluble - ['sɔljubl] - həлл олан.
to dissolve -[dɪ'zɔlv] - həлл етмək.
solvent - ['sɔlvənt] - həлледичи.
to poure - [pɔ:] - төкмək/габдан-габ/.
solution - [sə'lu:ʃən]- həлл, разылыг, ичəсə.
residue - [rɪ'zɪdju:]- галыг, фөрг.
mixture - ['mɪkstʃə] - гарышыг.
to suspend -[səs'pend] - асмаг.

tank -[tæŋk] – бөҗүк габ, чән.
denser -['densə] – даһа гаты, нисбәтән сых.
to sink -[sɪŋk] – батмаг, дибә чөкмәк.
to dissolve -[dɪ'zɔlvd] – дурулашдырмаг.
constantly -['kɔnstəntlɪ] – даими, һәмишәлик.
brought into -[brɔ:t 'ɪntʊ] – дахил етди.
contact -['kɔntækt] – контакт, әлагә.
basket -['bɑ:skɪt] – зәнбил.
desired -[dɪ'zaɪəd] – истәнилән, ихтиҗари.
to recover -[rɪ'kʌvə] – јенидән өртмәк, кери алмаг.
evaporation -[ɪ,væpə'reɪʃən] – бухарланма.
precipitation -[prɪ,sɪpɪ'teɪʃən] – дүшмә, чөкдүрүлмә.
extraction -[ɪks'trækʃən] – екстракт.
term -[tə:m] – вахт, мүддәт, рүб.
to employ -[ɪm'plɔɪ] – истифадә етмәк, тәтбиг етмәк.
stem- -[stem] – көвдә, сүтун/белдә/.
alcohol -['ælkəhɔl] – спирт.
carbon -['kɑ:bən] – карбон.
disulphide -[daɪ'sʌlfaɪd] – дисулфид/сулфид ики/.

EXERCISES

I. Translate the sentences and put questions(general and special questions).

1.Our industrial chemistry deals with the preparation of products from raw materials. 2.The products of chemical industry are exceedingly numerous and varied in character. 3.Many of them are used only in making other substances. 4.Thus the chemical industry become a network of interlacing processes.

5.Lixiviation is the process of separating soluble from in - soluble substances by dissolving the former in water or some other solvent poured over it. 6.Sometimes the mixture is put into baskets,or on gratings. 7.The insoluble substance remains on the grating,or in the baskets.

II. Answer the questions

1.Which day of the week do you like best ? 2.Which day of the week do you like at all? 3.Which day of the week is Sunday? 4.What time do you usually get up on Sundays? 5.Why do you switch on the radio? 6.When do you usually have your laboratory work on organic chemistry? 7.How much time do you spend to learn your chemistry? 8.Would you like to visit our chemical plants in Sumgait? 9.Do you often spend much time to come to the institute?

III. Translate sentences into Azerbaijan(Proper Uniform)

Seaman: Chief, what is the proper uniform to wear when you go before the Medical Board?"

Chief: "Clean underwear."

WORDS AND EXPRESSIONS

technical -['teknɪkəl] - техники.
sense -[sens] - hисс, дүшүнчә.
to denote -[dɪ'nout] - көстәрмәк, ифадә етмәк.
conversion -[kən'və:ʃən]- чевирлмә.
boiling point-['bɔɪlɪŋ pɔɪnt]- гаjнама нөктәси.
majority -[mə'ʤɔrɪtɪ]- үстүнлүк, чохлуг.
to recover -[rɪ'kʌvə] - кери алмаг, гаjтармаг.
to condense -[kən'dens] - гатылашдырмаг.
distillation -[ˌdɪstɪ'leɪʃən]- дестилля етмә.
spontaneous -[spɔn'teɪnjəs]- спонтан, гарышыг.
application -[ˌæplɪ'keɪʃən]- мүрачиәт, тәтбиг, хаһиш.
reduced -[rɪ dju:st] - азалдылмыш.
exposure -[ɪks'pouʒə] - мүдафиәсиз.
humidity -[hju:'mɪdɪtɪ]- нәмлик.
completeness -[kəm'pli:tnɪs] - там, бүтөв/лүк/.
dry weather -['draɪ 'weðə] - гуру hава.
brisk wind -[brɪsk 'wɪnd] - күчлү күләк.
to blow -[bləu] - есмәк/күләк/.
rapidly -['ræpɪdlɪ] - тез, чәлд.
manufacture -[ˌmænju'fækʧə] - истеһсал, мәмулат.
natural -['næʧrəl] - тәбии.
brine -[braɪn] - дуз мәһлулу.
application -[ˌæplɪ'keɪʃən]- тәтбиг/етмә/
flame -[fleɪm] - алов, од.
to pass through-[pa:s θru:] - кечмәк/ичерисиндән/.
size - [saɪz] - өлчү, hүдуд.

to set -[set] - гошмаг, дахил етмәк, чаламаг/ода,суја/.
to surround -[sə'raund] - әһатә етмәк, дөврәләмәк.
injury -['ɪndʒərɪ] - зијан, зәрәр.
overheating -['ouvə'hi:tɪŋ]- чох гыздырма .
jacketed pan-[dʒækɪtɪd pæn]- јанлары һәрүлмүш габ, чән.
kettle -['ketl] - чајник.
double-walled-['dʌbl 'wɔ:ld] - гоша диварлы.
to circulate -['sə:kjuleɪt] - фырламаг, сиркулјасија етмәк.
coil of pipe -['kɔɪl əv paɪp] - иланвари/змејавик/.

EXERCISES

I.Put questions to the sentences

1.There are four general methods of evaporation. 2.The first method,spontaneous evaporation in the open air,is comparatively slow,and requires exposure of very large surfaces of liquid. 3.This process is only used for the manufacture of salt from sea water. 4.The second method,by direct application of heat from a fire,is very largely used in the arts. 5.This may be done in two general ways. 6.The flames,or hot gases from the fire,are generally allowed to play directly on the bottom of the vessel containing the liquid. 7.These are simply double-walled vessels. 8.The steam may be allowed to circulate through coils of pipe,placed inside the vessel.

II.Answer the following questions:

1.How many chemical shops are there in our republic now? 2.Do you want to see them sometimes? 3.Which of these chemical plants are most popular today? 4.Is the 20th century becoming the age of atomic power?

Distillation - is the process of vaporizing a liquid and recovering it by condencing the vapors. The liquid by this condensation is called distillate. Distillation is chiefly employed to separate a liquid rrom none-volatile matter dissolved or suspended in it; or to separate one liquid from a mixture of liquids of different boiling points; that one having the lowest boiling points being the first to begin to pass off as vapor.

The separation of two misciple liquids by distillation depends on the difference between the composition of the vapor and of the boiling liquid from which it comes; and while never perfect is more complete the greater the differenee in composition.

During a distillation the boiling point gradually rises; and at the end there remains in the still a relatively small amount of the highboiling liquid very free from the other component, or else a mixture of maximum boiling point. While distillate has been enriched in the low-boiling constituent, it is far from pure, but repetition of the distillation improves the separation. In general it is easier to secure the high-boiling liquid free from the reverse.

If a mixed vapor be slowly cooled, the liquid to condense is that in equilibrium with the vapor; thus it is largely the less volatile component which separates first. By abstracting only enough heat to condense a part of the vapor, the remainder is greatly enriched in the volatile constituent; this fractional condensation is attained by using a condeiser with relatively hot cooling medium, the uncondensed vapors .

passing to a cold condenser for complete condensation . From the fractional or partial condenser, the condensate returns to the still for reboiling, to remove the remainder of the volatile component. Fractional condensation is equivalent to a redistillation, without the consumption of additional heat.

Words and Expressions

distillation	-[ˌdɪstɪ'leɪʃən]-	дестилләләтмә.
vaporizing	-['veɪpəraɪzɪŋ]-	бухарланма/процесс/.
to condense	-[kən'dens]-	гатылашдырмаг.
condensation	-[ˌkɔndən'seɪʃən]-	конденсасија, гатылашдырылма.
distillate	-[ˌdɪstɪ'leɪt]-	дестилләедилмиш мәһсул.
chiefly	-['tʃi:flɪ]	- әсас е'тибарилә.
non-volatile	-['nɔn 'vɔlətaɪl]-	учмајан, дурғун.
suspended	-[səs 'pendɪd]-	асылы, асылмыш.
lowest	-[ləʊest]	- ән алчаг.
misciple	-['mɪsəbl]	- гарыша билән/маддә/.
to depend(on)	-[dɪ 'pend]	- асылы олмаг/кимдән, нәдән/.
composition	-[ˌkɔmpə'zɪʃən]-	тәркиб, һеј'әт.
gradually	-['grædjʊəlɪ]	- тәдричән, јаваш-јаваш.
amount	-[ə'maʊnt]	- мигдар, һәчм.
highboiling	-[haɪbɔɪlɪŋ]	- јүксәк гајнама.
component	-[kəm'pəʊnənt]	- компанент, тәркиб һиссә.
to enriche	-[ɪn'rɪtʃ]	- варландырмаг, күбрәләмәк.
low-boiling	-[ləʊ 'bɔɪlɪŋ]	- алчаг гајнама.
constituent	-[kən'stɪtjʊənt]-	тәркиб һиссә.
pure	-[pjʊə]	- тәмиз.
repetition	-[ˌrepɪ'tɪʃən]-	тәкрар, јенидән.

to improve -[ɪm 'pru:v] - инкишаф етдирмәк.
separation -[ˌsepə 'reɪʃən] - аjрылма.
to secure -[sɪ 'kjuə] - тәмин етмәк, горумаг.
reverse -[rɪ 'və:s] - әкс һала кечмә.
mixed vapor -[mɪkst 'veɪpə] - гарышыг бухар.
to coole -[ku:L] - сојутмаг, нәмләндирмәк.
volatile component -['vɔlətaɪL] - учан компанент/һиссә/.
by abstracting -[æb 'strækt ɪŋ] - аjырмагла.
fractional -['frækʃənL] - кәср, там олмаjан.
to attaine -[ə'teɪn] - алмаг.
equivalent -[ɪ'kwɪvələnt] - еквивалент.
redistillation -['ri: dɪstɪ'leɪʃən] - jенидән дестилә.
consumption -[kən'sʌmpʃən] - истифадә етмә, ухрав.
additional -[ə'dɪʃənL] - әлавә.

EXERCISES

I. Put questions to the sentences:

1. Distillation is chiefly employed to separate a liquid from non-volatile matter dissolved or suspended in it. 2. The separation of two misciple liquids by distillation depends on the difference between the composition of the vapor and of the boiling liquid from which it comes. 3. In general it is easier to secure the high-boiling liquid free from the reverse. 4. Repetition of the distillation improves the sparation. 5. The volatile constituent is greatly enriched in a solution. 6. The condensate returns to the still for reboiling. 7. Fractional condensation is equivalent to a redistillation, without the consumption of additional heat.

II. Translate into Azerbaijan

1. Sailing near these islands in foggy weather is rather dangerous. 2.He had to give up sailing because of his having been appointed Chief-Master. 3.there are new projects of re - constructing big oil basins. 4.There are great oil companies in America today. 5.The Volga is not so long as the Lena, but it is more important being the longest river in the European part of the Soviet Union. 6.The large island separated from the continent of Europe by the English Channel is called Great Britain.7.Some foreign ships were sent back with Soviet oil.

III. Translate into English and put questions

I. Бир сыра кимјəви маддəлəрин лабараторија шəраитиндə алынмасы сəнаје үсулундан үчүз вə асандыр. 2. Лабараторијада маддəлəр сечилир сонра исə реаксија просеси башлајыр. 3. Реаксија просеси гуртардыгдан сонра биз алынмыш маддəлəри тəрəзидə чəкирик. 4. Нəр бир кимјəви маддəнин лабараторијада алынмасы тəлəбəлəр үчүн чох вачибдир. 5. Институтумузда чохлу кимја лабараторијалары вар. 6. Лабараторијалар мүасир аваданлыгларла тəчһиз едилмишдир. 7. Бу күн бизим групун ики лабаратория ишi вə бир снаг дəрси вар. 8. Тəчрүбi ишлəрдə биз бир-биримизə көмəк едирик. 9. Биз бүтүн кимјəви маддəлəрдə еһтијатла давранмалыјыг.

Sublimation - is the process of vaporizing a solid substance and condensing the vapors to again form the solid directly, without passing through an intermediate liquid state. There are very few substances which vaporize without melting, but in all cases of sublimation the change from the vapor to the solid state is direct, and without any formation of liquid. The sublimed body is recovered unchanged chemically.

Filtration - Filtration is the process of separating suspended solid matter from a liquid, by causing the latter to pass through the pores of some substance, called a filter. The liquid which has passed through the filter is called the filtrate. The filter may be paper, cloth, cottonwool, asbestos, slag or glass-wool, unglazed earthenware, sand, or other porous material.

Filtration is very frequently employed in chemical technology, and it often presents great difficulties. In most technical processes or operations, cotton cloth is the filtering material, but occasionally woolen or hair cloth is necessary. The cloth may be fastened on a wooden frame in such a way that a shallow bag is formed, into which the turbid liquid is poured. The filtrate, in this case, is cloudy at first, but soon becomes clear, and then the turbid portion is returned to the filter. Filtration is often retarded by the presence of fine, slimy precipitates, or by the formation of crystals in the interstices of the cloth, from the hot solution. Any attempt to hasten filtration by scraping or stirring the precipitate on the cloth, will always cause the filtrate to run turbid.

WORDS AND EXPRESSIONS

sublimation -[ˌsʌblɪ'meɪʃən] - сублимасија.
intermediate -[ˌɪntə'mi:djət] ара, фасилә.
sublimed -[sə'blaɪmd] -јүксәк, сүблимә едилмиш.
filtration -[fɪl'treɪʃən] - сүзмә.
filter -['fɪltə] - сүзкәч.
to filtrate -['fɪltreɪt] - сүзмәк.
cottonwool -['kɔtn'wul] - памбыг мәһсул.
asbestos -[æz'bestɔs] - азбест, даг кәтаны.
slag -[ʃlæg] - шлак.
glass-wool -[gla:s wul] - стекловат, шүшә памбыг /һәрфи мә,на/.
unglazed -['ʌnglezd] - шүшәләнмәмиш.
earthware -['ə:θ wɛə] - кил габ.
sand -[sænd] - гум.
porous material -['pɔ:rəs mə'tɪərɪəl] - сых/бәрк/ маддә.
frequently -[fri:kwəntlɪ] - тез-тез, адәтән.
to filter -[fɪltə] - сүзмәк, сүзкәчдән кечирмәк.
occasionally -[ə'keɪʒənlɪ] - етәри, тәсадүфи.
hair cloth -[hɛə klɔθ] - түк материал.
to fasten -['fa:sn] - тезләшдирмәк, бәркитмәк.
wooden frame -['wudn freɪm] - агач гәлиб, рама.
shallow bag -['ʃælou bæg] - назик ертүк.
turbid liquid -['tə:bɪd 'lɪkwɪd] - буланыг маје.
cloudy -['klaudɪ] - думанлы.
turbid portion -[tə:bɪd 'pɔ:ʃən] - буланыг һиссә.
to retarde -[rɪ'ta:d] - кечикдирмәк.
slimy precipitate -['slaɪmɪ prɪ'sɪpɪtɪt] - чирклы чөкүнтү.

interstice	-[ɪn'tɜ:stɪs]	- ара, фасилә.
attempt	-[ə'tempt]	- чәһд, сынаг.
to hasten	-['heɪsn]	- тезләшдирмәк.
to scrap	-[skræp]	- гырыгламаг.
to stir	-[stɜ:]	- тәрпәтмәк, һәрәкәт етдирмәк.

EXERCISES

I. Put questions (general and special questions)

1. Sublimation is the process of vaporizing a solid substance and condensing the vapors to again form. 2.There are very few substances which vaporize without melting. 3.Filtration is the process of separating suspended solid matter from a liquid. 4. The liquid which has passed through the filter is called the filtrate. 5.In most technical processes or operations, cotton cloth is the filtering material. 6.Filtration is often retarded by the presence of fine,slimy precipitates.

II. Translate into English.

I. Республикамыз кимја заводлары илә чох әәнкиндир. 2. Республикамызда ән бөјүк кимја мүәссисәләри Бакыда, Сумгајытда вә Кәнчәдәдир. 3. Сумгајыт Загафгазија республикалары арасында ән бөјүк кимја шәһәридир. 4. Бир чох алимләр Азәрбајчаны һагды олараг нефт академијасы адландырырлар. 5. Азәрбајчан өз кимја сәнајеси мәһсулларыны Совет Иттифагының бир чох шәһәрләринә ихрач едир. 6. Күндәлик мәишәтимизде кимја мәһсулларының ролу күндән-күнә артмагдадыр. 7. Кимја сәһәсиндә өлкәләримиз арасындакы әмәкдашлыг онун инкишафына јахшы көмәк едир.

Crystallization - Crystals are chemically homogenous bodies, usually having regular polyhedral forms, and whose molecules have arranged themselves regularly according to definite laws. The tendency to form crystals is common to almost all chemical compounds under certain conditions, the forms of the crystals being characteristic of the substance.

Crystals may form from a fusion, or by sublimation; but crystallization almost always takes place from solution.

In general, the solubility of a substance increases as the temperature of the liquid rises; when the boiling point is reached, under atmospheric pressure, the rise intemperature ceases, and no more of the substance dissolves. When a liquid has dissolved all of a solid that it can hold in solution at certain temperature and pressure, it is said to be saturated for that temperature. Any decrease in the temperature results in the separation of a part of the substance usually as crystals. There are a few instances where the maximum solubility is reached at temperatures much below the boiling point of the solution, the most notable of these salts being sodium carbonate and sodium sulphate, both reaching the maximum solubility below 35 C. During the formation of the crystal, there is a tendency to exclude from it all matter not homogenous with it; hence this is an excellent method of purifying salts. But if a concentrated solution, which is very impure, is allowed to crystallize, the impurities may become enclosed in or enragled among the crystal as they form, producing an impure product. This can often be prevented by stirring the solution while crystallizing, thus causing the formation of very fine "crystals

meal", which may be more readily washed free from mother-liquor and impurities. The liquid from which the crystals have deposited, is called the mother-liquor; it contains the greater part of the soluble impurities present in the original solution, and also a considerable quantity of the salt,which has not deposited as crystals. The amount of the latter depends upon the temperature at which the crystallization took place. By further evaporation more crystals may be obtained, but they are less pure than those first separated. Thus the impurities accumulate in the mother-liquor,and in many cases, being valuable salts themselves, are recovered, and add to the profits of the industry. On the other hand, the mother liquors from some processes are the cause of much annoyance and expense to the manufacturer, since from their corrosive, poisonous, or offensive nature, they can not run into the streams, and their disposal in some other way becomes necessary.

If a consentrated solution is allowed to stand quietly while crystallizing especially if there is a considerable quantity of the liquid and the temperature falls very slowly, the crycrystalls formed and well defined; on the other hand, if it be stirred, the crystalls are small and imperfectly developed, constituting the crystal deal above mentioned. Since large crystals are compact and offer a relatively small surface to the action of water, they dissolve very slowly, unless pulverized. Crystal meal dissolves more readily, and for this reason is becoming more and more popular with manufacturers.

WORDS AND EXPRESSIONS

homogeneous body -[ˌhɔməˈdʒi:njəs] - һәмчинс мадде.
polyhedral -[ˌpɔliˈhedrəl]- чохтәрәфли.
according to -[əˈkɔ:diŋ] - көрә, сајәсиндә.
compound -[kɔmˈpaund] - мүрәккәб.
certain condition-['sə:tn kənˈdiʃn]- мүәјјән шәрт.
atmospheric pressure-[ˌætməsˈferikˈpreʃə] - атмосфер тәзјиги.
to cease -[si:s] - кәсмәк, дајандырмаг.
saturated -['sætʃəreitid]- сых, интенсив,һопмуш.
decrease -[diˈkri:s] - азалмаг, јох олмаг.
solubility -[ˌsɔljuˈbiliti]- һәлл олма.
sodium carbonate -[soudjəmˈka:bənit] - натриум карбонат.
sodium sulphate -['soudjəmˈsʌlfeit] - натриум сулфат.
below -[biˈlou] - ашағы/дәрәчә, сәвијјә/.
to exclude -[iksˈklu:d] - харич етмәк, чыхармаг.
hence -[hens] - бурадан да.
purifying -['pjuərifaiŋ] - тәмизләјәрәк.
impure -[imˈpjuə] - чиркли.
to enra gle -[inˈ--gl]- дағылмаг,парчаланмаг.
to prevent -[priˈvent]- мане олмаг.
mother liquid -['mʌðəˈlikwid] - тәбии маје.
to deposite -[diˈpɔzit] - чөкүнтү.
considerable -[kənˈsidərəbl]- вачиб, чох, сечилән.
quantity -['kwɔntiti] - мигдар, кәмијјәт.
to accumulate -[əˈkju:mjuleit]- топламаг.
annoyance -['ənɔiəns] - дарыхдырычы.
ineffective -[ˌiniˈfektiv]- еффектсиз,гадир олмајан.
inductor -[inˈdʌktə] - индуктор.
nestle -['nesl] - рәһат, әлверишли.

expence -[iks'pens] - гиjмэт, хэрч.
corrosive -[kə'rousiv] - jejичи, дагыдычы.
poisonous -['pɔizənəs] - зэhэрли.
offensive nature-[ə'fensiv] - пис характерли.
stream -[stri:m] - ахын.
disposal -[dis'pouzəl] - кечирилмэ, вэзиjjэт.
consentrated -['kɔnsentreitid] - бэркидилмиш.
quietly -['kwaiətli] - тамамилэ, сэрбест.
imperfectly -[im'pə:fiktli] - там олмаjан, гусурлу.
constituting -['kɔnstitju:tiŋ] - эмэлэ кетирмэ..
compact -[kəm'pækt] - долу, интенсив.
to pulverize -['pʌlvəraiz] - тозландырмаг.
air-wall -[ɛə wɔ:l] - hава тэбэгеси, дивары.
heat-eliminating-[hi:t i'liminetiŋ] - hава чыхаран, лэгв едэн.
menstruum -['menstruəm] - hэлледичи.
rare-earth -[rɛə ə:θ] - надир/хусуси/ торпаг.
quicksilver -['kwik,silvə] - чивэ.
air-pressure -[ɛə preʃə] - hава тэзjиги.
heat-stable -[hi:t'steibl] - ода давамлы.
heels -[hi:lz] - галыг.
high-heat -[hai hi:t] - jуксэк истилик.
high-boiling -[hai bɔiliŋ] - jуксэк гаjнама.
humid -['hju:mid] - нэм.
hump -[hʌmp] - галаг, тэпэ.
to condense -[kən'dens] - гатыланмаг.
consistency -[kən'sistənsi] - ардычыллыг.
spirit of ether-['spirit i:θə] - эфир.

E X E R C I S E S

I. Put questions to the sentences(special and general questions)

1. Crystals are chemically homogenous bodies. 2. Crystals may form from a fusion, or by sublimation. 3.There are few inct tances where the maximum solubility is reached at temperatures much below the boiling point of the solution. 4. This can often be prevented by stirring the solution while crystallizing. 5.The liquid is called the mother-liquor. 6.The amount of the latter depends upon the temperature at which the crystallization took place. 7.They can not run into the streams. 8.The crystalls formed and well defined. 9.Crystal meal dissolves more readily, and for this reason is becoming more and more popular with manufacturers.

II. Read and relate the following part.

One evening several tourists who were staying at ahotel in Manchester were having dinner in the hotal restaurant. Fish was brought and while they were eating it, some of them told interesting stories about finding rings and other things inside fish. an old man who had only listening to their stories and never spoken a word, suddenly said that he would like to tell them an interesting story,too. And this is what he told them:

"When I was a young man, I lived in New York and was going to marry a beatiful young girl whose name was Alice.About two months before our marriage I was sent to England for a fort - night. I went to say good-bye to Alice and gave her a ring. She gave me hers and said that she would be waiting for me. But I had to stay in England six months, and not a fortnight as I had planned. Late in September my work was done at last and

I was able to leave for New York.

Next morning, when I was already aboard the steamer, I was looking through the morning newspaper, and what do you think I saw?

Alice was going to marry another man. I couldn't beleive my eyes, but it was true. I was so angry that I threw her ring into the sea.

I was having dinner at a restaurant in New York a few days later, and while I was eating the fish, I bit on something hard. What do you think it was?

"The ring." all the listeners cried out at once.

"No,"said the old man sadly, "it was a fish-bone".

POLYMERS

The name polymers doesn't give any idea of science's new achievements or of their bright prospects for engineering. What are polymers? Polymers comprise a great variety of synthetic substances produced iron chemicals. A typical instance of polymers is plastics; when moulded under heat and pressure they can take any form and are in wide use in industry and houshold.

The assortment of polymer materials manufactured by our industry is growing every year. Their manufacture confronts science with new tasks requiring intensive research. Polymers have two main disadvantages. Like metals, wood and stone polymer materials and articles made of them lose their initial properties under the influence of atmospheric conditions: light, moisture and temperature changes. Hence it is necessary to search for means preserving their properties. Secondly, polymers age: they require special age control measures prolonging their life.

Much effort is being made to develop polymers withstanding high temperatures and remaining unaltered for long period of time. For instance, in order to protect certain types of rubbers from the influence of ozone destroying some of their properties, wax is added to them and a protecting coating develops on the article produced. The introduction of aluminium, titanium, cobalt and other elements into the molecules of polymers can produce a material resembling minerals in their properties, able to withstand temperature changes. Research into these problems is of greate theoretical and practical interest.

WORDS AND EXPRESSIONS

polymer - [ˈpɔlɪmə] - полумер.
to comprise - [kəmˈpraɪz] - дахил етмәк, сахламаг.
houshould - [ˈhaʊshoʊldʒ] - аилә, ев.
assortment - [əˈsɔ:tmənt] - груплашдырма, сечмә.
confront - [kənfrʌnt] - үзләшмәк, мүгаҗисә етмәк.
research - [rɪˈsə:tʃ] - тәдгигат, ахтарыш.
to prolong - [prəˈlɔŋ] - узатмаг, давам етмәк.
effort - [ˈefət] - күчләндирмә.
to withstand - [wɪðˈstand] - давам кәтирмәк.
unaltered - [ʌnˈɔ:ltəd] - дәјишмәјән, сабит.
ozone - [ˈoʊzoʊn] - озон.
wax - [wæks] - парафин.
protecting - [prəˈtektɪŋ] - мүдафиә едәрәк, горујараг.
influence - [ˈɪnfluəns] - тәсир.
titanium - [tɑrˈteɪnjəm] - титан.
cobalt - [kəˈbɔ:lt] - кобалт.
resembling - [rɪˈzembliŋ] - охшајараг.
theoretical - [θɪəˈretɪkəl] - нәзәри.

EXERCISES

I. Put questions to the sentences

1. Polymers comprise a great variety of synthetic substances produced from chemicals. 2. The assortment of polymer materials manufactured by our industry. 3. Polymers have two main disadvantages. 4. Much effort is being to develop polymers. 5. Polymers

are the most important industry material today. 6. Research into these problems is of great theoretical and practical interest. 7. Polymers have become steel more complex, and steel more intriguing in modern industry.

II. Chose the theme and describe it :

1. The birth of polymer in our industry

2. Polymers in our everyday life

3. Getting of polymers in laboratory

III. Translate the sentences into Azerbaijan

1. Nikita put his knife back in his pocket and looked out through a chink between the lamps of snow. 2. Mother read the letter at last while they were at lunch. 3. The pendulum was swinging in the moonlight, the old man and woman were looking down sternly. 4. All their thoughts were hopelessly mixed up. 5.There was the smell of a samovar and of warm bread. 6. The wet wind blew for three days, eating away the snow. 7. The sun was reflected from the wash-basin in a trembling patch of light on the wall.

P L A S T I C S

Plastics are known to be used in a variety of ways. By their chemical properties plastics are generally more resistant to environments which attac comman engineering materials such as steel, wood, and rubber. Most plastics are rather inert to the atmosphere and to salt, fresh, or soil water. Very good resistance is usually shown by plastics to any attac by inorganic acids. With the exception of cellulose nitrate which is very flammable, plastics in many case are non-flammable, self-extinguishing, or burn very slowly.

Much more than metals plastics easily combine with other materials like wood, fibres and paper.

Plastics are good thermal and electric insulators, all ha - ving dielectric strength.

The advantages of the plastic material includs the combina - tion of light weight with good strength.
Because plastic materials have only low thermal conductivity, heat does not pass through them very quickly, and if they were exposed to a high temperature for a short period, the interior temperature of the plastics would be remain much lower than would be the case with metals.

Although plastics are chemically inert to water they all with rare exceptions may absorb or lose moisture. Repeated changes in moisture content, variations in temperature, and a long exposure to sunlight may lead to reducing mechanical properties in most plastics.

WORDS AND EXPRESSIONS

plastics = [ˈplæstɪks] - пластик.
in a variety of ways -[vəˈraɪətɪ] - мухтәлиф јолла.
property - [ˈprɔpətɪ] - хассә, хүсусијјәт, кејфијјәт.
resistant -[rɪˈzɪstənt] - мәнкәм, давамлы.
environments -[ɪnˈvaɪərənmənts] - мүһит, вәзијјәт.
to attack - [əˈtæk] - һүчум етмәк, киришмәк.
common - [ˈkɔmən] - үмуми, һамылыгла.
engineering material -[ˌenʤɪˈnɪərɪŋ] - тикинти материаллары.
soil water - [sɔɪl ˈwɔtə]- чод/чиркли/ су.
resistance - [rɪˈzɪstəns]= мәнкәм, давамлы.
inorganic acid -[ˌɪnɔːˈgænɪk] - гејри-үзви туршу.
cellulose - [ˌseljuˈlous] - селулоза.
flammable - [ˈflæməbl] - јанан, аловланан.
self-extinguishing -[ˌself ɪksˈtɪŋgwɪʃɪŋ]- өзү кечирән/алову/
fibre- [ˈfaɪbə] - лиф.
thermal -. [ˈθəːməl] - исти, термик.
electric insulator - [ɪˈlektrɪk ˈɪnsjuleɪtə] - електрик изолјатор.
dielectric strength -[ˌdaɪɪlektrɪkˈstreŋθ]- диелектрик мүгавимәт.
advantage = [ədˈvɑːntɪʤ]- үстүнлүк.
conductivity -[ˌkɔndʌkˈtɪvɪtɪ]- кечиричилик.
interior - [ɪnˈtɪərɪə] - ичери, дахили.
to absorb - [əbˈsɔːb] - удмаг/нәми/.
moisture - [ˈmɔɪsʧə] - јаш, нәм.
firmly - [ˈfəːmlɪ] - бәрк, мәнкәм.
polymeric - [ˌpɔlɪˈmerɪk] - полумер/ик/.

E X E R C I S E S

I. Answer the questions to the text :

1. What plastics do you know ? 2. What are the properties of plastics ? 3. What properties of plastics are important ? 4.What are the advantages of plastics ? 5.What engineering materials are less resistant to environments than plastics? 6.What engineering materials do you know? 7. What plastics do we used in our everydau life? 8. What kind of plastics do we used in machine building industry? 9. Are there any characteristic differences among the metal and plastic materials? 10 Do we use plastics in ship building? 11. What is the future advantage of plastics?

II. Fill in the blanks with one of the words from the text and traslate the sentences in to Azerbaijan :

common, thermal, conductivity, properties, varied, electric, car, ones, obtained, truck, resist, fibre, dielectric, resistance, production, advantages

1. By their chemical.... plastics are generally more resistant to environments which attack materials. 2.Good..is usually shown by plastics to any attack by inorganic acids. 3. The physical properties of plastics are just as....as are their chemical..... 4. The plastics are good ... and ... insulators, all having ... strength. 5. The rang of specific ... is between approximately 1.0 and 2.0 6. Because plastic materials have only low thermal ... heat does not pass through them quickly.

APPLICATION OF PLASTICS

Of all materials that can go into building none is more in - triguing - to the average architectural designer than plastics. plastics have become still more complex, and steel more intriguing

Much of the confusion conserning plastics seems to arise from a failure to recognize that the term does not relate to a single material but to many materials. Plastics possess at least as broad a rang of properties as metals, and are capable of at least as great a diversity of compositions. Much more than metals, they are commonly combined with other metals like wood, paper, fabrice and fibres to provide steel more diverse properties. Often the combination possesses unique properties which could not be supplied by either constituent by itself.

Finally, presence of the plastic may be so completely hidden, as in coatings, that it comes as a suprise to realize that the plastic is there.

In marine work, plastics play a large part in the decorative effects in the saloons of liners, table tops, swimming pools,etc. Many of the lifeboats carried on the big liners are so made, and the advantage is, of course, the dead weight in the ship is reduced.

In the production of guided missiles reinforced plastics play an essential part in providing a material that embodies light weight, high strength, resistance to high temperatures, and good dielectric properties.

Plastics are applied to intercontinental ballistic missiles

because the major part of the journey of these takes place above the Earth's atmosphere, but on re-entering the latter, great heat is developed as the missile contacts the air. And plastics are known to resist high temperatures very well.

WORDS AND EXPRESSIONS

application - [æplɪ'keɪʃən] - тәтбиг /етмә/.
none - [nʌn] - heч /нә, бир, кәс/.
intriguing - [ɪn'tri:gɪŋ] - гарышыглыг салма.,
average - ['ævərɪdʒ] - орта/елчү, һәдд, мигдар/.
architectural - [ˌɑ:kɪ'tektʃərəl] - һејкәлтарашлыг.
designer - [dɪ'zaɪnə] - лајиһәчи, мүәллиф.
concerning - [kən'sə:nɪŋ] - аид/әлагәдар / олан.
to arise from a failure to recognise - үгурсузлугу е'тираф етмәк.
to relate - [rɪ'leɪt] - гошмаг, әлагәләндирмәк.
to possess - [pə'zes] - малик олмаг.
at least - [æt li:st] - үзаг башы, ахырда.
range - [reɪndʒ] - ранг, чәркә, дәстә.
capable - ['keɪpəbl] - гадир олма. тадир.
diversity - [daɪ'və:sɪtɪ] - үјгунсузлуг.
fabrics - ['fæbrɪks] - парча, материјал, мә'мулат.
fibres - ['faɪbəz] - лиф/синтетик/.
unique - [jʊ'ni:k] - ваһид, јеканә.
by either constituent by itself - не дә өз башга тәркибләри илә.
as in coating - [koutɪŋ] - палтонүн алтында олан кими.
marine work - [mə'ri:n wə:k] - кәмигајырма .

decorative -[ˈdekərətɪv] - декаратив, бөзөк.
effect -[ɪˈfekt] - еффект, фајда.
saloon of liner-[səluːnəvlaɪnə] - тәјјаре салону.
table top -[teɪbl tɔp] - столүстү.
swimmong pool -[ˈswɪmɪŋ puːl] - чиммәк үчүн көл/hовуз/.
lifeboat -[ˈlaɪfbout] - хиласедичи гајыг.
dead weight -[ded weɪt] - өлү/әсил/ чәки.
is reduced -[ɪz rɪdjuːst] - азалдылыр.
guided missiles-[ˈgaɪdɪd ˈmɪsaɪl] - ракет гурғулары.
reinforced -[rɪɪnfɔːst] - мөhкәмләндирилмиш.
essential part-[ɪˈsenʃəl paːt] - әсас/вачиб/hиссә.
to embody -[ɪmˈbɔdɪ] - өзүнә чәкмәк, удмаг.
light weight -[laɪt weɪt] - јүнкүл чәки.
high strength -[haɪ streŋθ] - јүксәк көркинлик.
resistance -[rɪˈzɪstəns] - мүгавимәт.
dielectric property-[daɪɪˈlektrɪk ˈprɔpətɪ] - диелектрик хассә.
intercontimental -[ˈɪntəˌkɔntɪˈnentl] - континентләр арасы.
ballistic - [bəˈlɪstɪk] - баллистик.
re-enter -[rɪːenˈtə] - јенидән дахил олмаг.

EXERCISES

I. Put questions (general and special) to the sentences

1. Plastics are commanly combined with other materials like wood, paper, fabrics, and other fibres. 2. Often the combination possesses unique properties which could not be supplied by either constituent. 3. The presence of the plastics may be completely hidden. 4. Many of the life boats carried on the bi- liners, table tops etc. Some kinds of modern plastics are used in chemi - cal laboratories, school work shops,but other kinds of them are used only in aeroplane building.

II. Translate into Azerbaijan and put questions

1. Today every Azerbaijanian knows of the amount of agricul - tural products having increased all over the country as a result of Lenin's cooperative plan. 2. In future a very powerful machi - nes will be used in our industry. 3. Coal mining is one of the advanced industry field in England. 4. Automation has reached the highest point in some chemical plants in Sumgait. 5. In past our chemical plants were not supplied with modern apparatus. 6. To - day the Soviet chemical industry is the most advanced industry not only in our country and even in the world. 7. We all are in need of getting high education on chemistry. 8. From day today many modern chemical materials are used instead of metals. 9. Great attempts in chemical laboratories always ended with good results by our famous scientists.

II. Translate questions into English and describe:

1. Республикамызда кимја кимин ады иле бағлыдыр?
2. Кимја сәнајесинин кәлечек перопективлери
3. Мудафие мегсәдлеринде кимјанын ролу
4. Ән керкемли Азербајчан алими ве онун ихтиралары
5. Совет кимјачы алимлери харичи елке кимјачылары иле сых әмәкдашлыг едирлер.

C A T A L Y T I C P R O C E S S E S

These processes attract manufacturers, since the plant occupies less ground area and does away with the costly lead chambers and the platinum-pan consentration; all strengths of acids from the weakest to the most consentrated monohydrate of 98.5 per cent H_2SO_4, and even fuming acid, can be produced in the same works, and with comparative ease. Further, no nitre, with the accompanying recovery process, is necessary.

The raw mateials are sulphur dioxide and oxygen from the air to produce SO_3. By solution of the sulphur dioxide in water, any consentration of acid can be made.

The equation $2\,SO_2 + O_2 = 2\,SO_3$ shows a characteristic gas reaction. The equilibrium constant $K = P_{SO_3}$ is given in the following table; note that dissociation of the trioxide increases rapidly with the temperature :

Degrees C.	450	528	579	627	680	727	832
Kp. . . .	188	31,3	13,8	5.54	3.24	1.86	0.956

In the absence of a catalyzer the rate of a reaction is negligible below 400 C.; with finely divided platinum, combination may be detected at 200 C .; and becomes rapid above 500 to 600 any surface is fairly active and burned pyrites cinder may be used. The reaction evolves 21.7 CaL , and unless the resulting rise of temperature is controlled by dilution of the gases, and radiation of the heat, reversal of the reaction and destruction of the apparatus results. This necessary temperature control is secured by enclosing the reaction chamber within the flue, in

which the cold mixture of sulphur dioxide and air is passing to the catalyser, thus cooling the contact mass and apparatus, and warming the mixed gases to the initial temperature. Or regulated of the cold mixture are passed into the contact chamber at different points. By use of spongy platinum, the reaction may be carried on at 400 to 450 C., with nearly quantitative conversion; with less active accelarators, higher temperatures (500 C., or more) are required, and oxidation is less complete, necessitating recovery of the residiual sulphur dioxide from the exit gases.

The catalysers most in use are spongy platinum and iron oxide from pyrites burners. The platinum mass may be platinized asbestos, or a sponge of metallic platinium disseminated through a porous mass of none-volatile soluble sulphates, oxides, or similar substance.

The presence of flue dust, sulphur vapors, or of arcenic, phosphorus, or mercury compounds in the mixed gases acts very injuriously upon the contact mass, soon rubbering in active or causing rapid destruction of the apparatus. These substances must be entirely removed from the birner gases by cooling, scrubbing with water, injecting steam, or filtering.

By absorbing the sulphur trioxide produced in the contact processes in consentrated sulphuric acid, a brown, oily liquid is obtained, which fumes in the air, owing to the escape of some of the dissolved sulphur oxides. Sulphir dioxide fume cannot be dissolved in dilute sulphuric ac id, and hence concentrated acid must be used, which is later diluted to the desired strength.

WORDS AND EXPRESSIONS

to attract -[ə'trækt] - чәлб етмәк, чәкмәк.
costly -['kɔstli] - гиjмәтли, баһа.
platinum pan -[plætinəm pæn]- платин әртүклү таб.
to accompany -[ə'kʌmpəni] - мүшаjиет етмәк.
equation -[i'kweiʃən] - бәрабәрлик, ejнилик.
equilibrium -[i:kwi'libriəm]- тараазлыг.
dissociation -[di,sousi'eiʃən]- диссосиасиjа.
trioxide -[trai'ɔksaid]- үч оксид/оксикен үч/.
negligible -['negligəbl] - кичик, һесаба кәлмәjән.
below -[bi'lou] - ашағы/дәрәчәдән, сәвиjjәдән/.
cinder -['sində] - шлак/jанмыш даш көмүр/.
to evolve -[i'vɔlv] - бурахмаг/истини, газы/.
reversal -[ri'və:səl] - дәjишиклик, jох олма.
catalyser -['kætə,laizə] - катализатор.
cooling -['ku:liŋ] - сојудулма, сәринләмә.
mixed gases -[mikst 'gæsiz]- гарышыг газлар.
spongy platinum -['spʌnʤi ~] - губкавари платин.
quantitative conversion -[kwɔntitətiv kən'və:ʃən]-кәмиjjәт дәjишмәси.
accelarator -[æk'seləreitə]- катализатор, гызышдырыҹы.
necessitating recovery -[ni'sesi'teitiŋ ~] мәчбури рекенерасиjа
residiual -[ri'zidjuəl] - галыг фәрг.
exit gases -['eksit 'gæsiz]- харич олан газлар.
platinized -['plætinaizd]- платинләшдирилмиш.
asbestos -[æz'bestɔs] - азбест.
disseminated -[di'semineitid]- дағыдылмыш, сәпәләнмиш.
to warm -[wɔ:m] - иситмәк, гыздырмаг.

porous mass -[ˈpɔ:rəs] -məsamili, смес.
none-volatile soluble-[ˈnɔnvɔlətaiˈsɔljubl] бухарланмајан həlledici.
flue dust -[flu: dʌst] toz.qazə-
arcenic -[a:ˈsenik] - арсен,
phosphorus -[ˈfɔsfərəs] - фосфор.
mercury -[ˈmə:kjuri] - чивə.
injuriously -[inˈdʒuəriəsli] - зијанлы, təhlükəli.
injecting steam -[in dʒektiŋ sti:m] - үфүрүлмүш бухар.

EXERCISES

I. Put questions to the sentences and translate into Azerbaijan

1. The raw materials are sulphur dioxide and oxygen from the air to produce SO. 2. This necessary temperature control is secured by enclosing the reaction chamber within the flue. 3. By use of spongy platinum, the reaction may be carried on at 400 to 450 C., with nearly quantitative conversion. 4. The platinum mass may be platinized asbestos . 5. By absorbing the sulphur trioxide produced in the contact processes in consentrated sulphuric acid.

II. Chose one of these themes and compose a report

1. Azerbaijan as an oil Academy of USSR
2. To describe the chemical laboratory
3. My summer vacation
4. Chemical products in our everyday life

O L D A L C H E M Y

Ancient alchemists tried for hundreds of years to turn mercury into gold by chemical means. Some men devoted all their lives to this impossible task. Today this classic reaction has been performed in reverse, not by chemical means but through atomic radiation. Scientists have made mercury from gold with the help of atomic reactor. The result is superpure mercury containing one isotope-198.

Mercury has seven stable isotopes , therefore its spectral lines are not clear. Mercury-198 has unusually fine and sharp spectral lines, and the scientists wanted to use it in an important optical instrument. They needed about a gram of mercury-198.

Gold decays to mercury when it is bombarded with neutrons. The process is simple: gold picks up one neutron and forms radioactive gold which decays to mercury. Since gold has only one isotope, gold-197, only one isotope of mercury is formed— mercury - 198.

The scientists took 600 grams of pure gold powder, placed it in an atomic reactor and left it there for 10 months. Then the gold was taken out and left in a special container for another two months, so that all the radioactive material could decay. Then the gold was removed from its container and distilled. Of the 600 grams of gold powder 1 gram of mercury - 198 was received. Its value is 3,000 dollars. (One gram of gold costs a little over one dollar.)

This method of getting the pure isotope is not practical

and will not be used on a large scale, but the alchemists of old times can be a little happier in their graves knowing that their task has been accomplished even if in reverse.

WORDS AND EXPRESSIONS

modern -['mɔdən] - мүасир, јени.
alchemy -['ælkimi]- алкимја.
ancient -['einʃənt]- гәдим, көһнә.
alchemist -['ælkimist]- кимјачы.
to turn -[tə:n]- дөндәрмәк, чевирмәк.
mercury -['mə:kjuri]- меркури, civə.
mean -[mi:n]- мәна. мəзмун.
to devote -[di'vout]- һәср етмәк.
in reverse -[ri'və:s] - әксинә, әкс һалда.
radiation -[reidi'eiʃən]- радиасија, шуаланма.
reactor -[ri:'æktə] - реактор, мадде.
superpure -[ˌsju:pə'pjuə] - чох тәмиз.
isotope -['aisoutoup]- изотоп.
stable -['steibl] - сабит, дурғун.
spectral -['spektrəl]- спектрик, спектр.
sharp -[ʃa:p] - ити, кәскин.
instrument -['instrumənt]- алət.
decay -[di'kei] - чүрүмə, дағылма.
bombarded -[bɔm'ba:did] - бомбарде едилмиш.
radioactive-['reidiouæktiv] - радиоактив.
powder -['paudə] - тоз, барыт.

container -[kən'teɪnə] - габ, чән.
pure -[pjuə] - təmiz.
on a large scale-[ɔn ə 'skeɪl] - böjük miqdarda.
grave -[greɪv] - qəbir, məzar.
to accomplish-[ə'kʌmplɪʃ] - tamamlamaq.

EXERCISES

I. Put questions to the sentences :

1. Some men devoted all their lives to this impossible task. 2. Scientists have made mercury from gold with the help of atomic reactor. 3. Mercury has seven stable isotopes. 4. They needed about a gram of mercury. 5. The process is simple. 6. The scientists took 600 grams of pure gold powder. 7. Then the gold was removed from its container and distilled. 8. One gram of gold costs a little over one dollar.

III. Translate into Azerbaijan(Letters of Condolence):

A letter of condolence should be written promptly as soon as you hear the news-and before shock of it has worn off. Put down simply and truthfully what you think and feel at that moment. Remember that the three most essential qualities of a good condolence letter are fact, sincerity and brevity.

Here is an example.

Dear Miss Stevens,

Please accept my very deepest sympathy on the death of your father.

I can well appreciate what a great loss this must be to yuo.

Sincerely yours,

Olga Kotova.

Non-Standard Verbs

NN	Infinitive		Past indefinite	Past participle
1	arise	бап вермек	arose	arisen
2	awake	аҗылмаг/духудан/	awoke	awoke
3	be	олмаг.	was,were	been
4	bear	догулмаг	bore	born
5	become	олмаг.	became	become
6	begin	башламаг	began	begun
7	blow	өомек, үҫүрмек	blew	blown
8	break	сындырмаг	broke	broken
9	bring	кэтирмек	brought	brought
10	build	тикмек.	built	built
11	burn	јан/дыр/маг	burnt	burnt
12	burst	агламаг	burst	burst
13	buy	алмаг/пулла/	bought	bought
14	catch	тутмаг	caught	caught
15	choose	сечмек	chose	chosen
16	come	кэлмек	came	come
17	cut	кесмек	cut	cut
18	dig	газмаг	dug	dug
19	do	етмек	did	done
20	drink	ичмек	drank	drunk
21	eat	јемек	ate	eaten
22	fall	јыхылмаг	fell	fallen
23	feed	једирмек	fed	fed
24	fight	вурушмаг	fought	fought
25	find	тапмаг	found	found

NN	Infinitive		P.Indefinite	P.Participle
26	fly	учмаг	flew	flown
27	forbid	гадаған етмәк	forbade	forbidden
28	forget	унутмаг	forgot	forgotten
29	freeze	донмаг	froze	frozen
30	get	елдә етмәк	got	got
31	give	вермәк	gave	given
32	go	кетмәк	went	gone
33	grow	артмаг, бәjүмәк	grew	grown
34	have	малик олмаг	had	had
35	hear	ешитмәк	heard	heard
36	hit	вурмаг	hit	hit
37	hold	тутмаг	held	held
38	keep	сахламаг	kept	kept
39	know	билмәк	knew	known
40	lay	гоjмаг/jерә/	laid	laid
41	lead	апармаг	led	led
42	learn	өjрәнмәк	learnt / learned	learnt / learned
43	leave	тәрк етмәк	left	left
44	let	ичазә вермәк	let	let
45	lie	узанмаг	lay	lain
46	light	jандырмаг/ишыгы/	lit / lighted	lit / lighted
47	lose	итирмәк	lost	lost
48	make	дүзәлтмәк	made	made
49	mean	мәна вермәк	meant	meant
50	meet	гаршыламаг	met	met
51	pay	өдәмәк	paid	paid

NN	Infinitive	Past Indefinite	Past participle
52	put - гоjмаг	put	put
53	read охумаг	read	read
54	ride минмәк/ат,машын/	rode	ridden
55	ring зәнк вурмаг	rang	rung
56	rise галдырмаг	rose	risen
57	run гачмаг	ran	run
58	say демәк	said	said
59	see көрмәк	saw	seen
60	sell сатмаг/мал/	sold	sold
61	send кондәрмәк	sent	sent
62	set гоjмаг/jерләш-мәк/	set	set
63	shine ишыг сачмаг	shone	shone
64	show көстәрмәк	showed	showed
65	shut бағламаг	shut	shut
66	sing охумаг	sang	sung
67	sit отурмаг	sat	sat
68	sleep jатмаг	slept	slept
69	speak данышмаг	spoke	spoken
70	spend хәрҗләмәк	spent	spent
71	spoil корламаг	{spoilt spoilled	{spoilt spoiled
72	stand дурмаг	stood	stood
73	steal оғурламаг	stole	stolen
74	strike вурмаг	struck	struck
75	sweep сүпүрмәк	swept	swept
76	swim үзмәк/суда/	swam	swum

NN	Infinitive	Past indefinite	Past Participle
77.	teach -өйрәтмәк	taught	taught
78	tear чәрмәг	tore	torn
79	tell дәмәк	told	told
80	think фикирләшмәк	thought	thought
81	throw атмаг/даш, агач/	threw	thrown
82	understand баша дүшмәк	understood	understood
83	wake оятмаг	woke waked	woken waked
84	wear кәйәнмәк	wore	worn
85	weep агламаг	wept	wept
86	win удмаг/идманда/	won	won
87	wind күләкләмәк	wound	wound
88	write язмаг	wrote	written

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