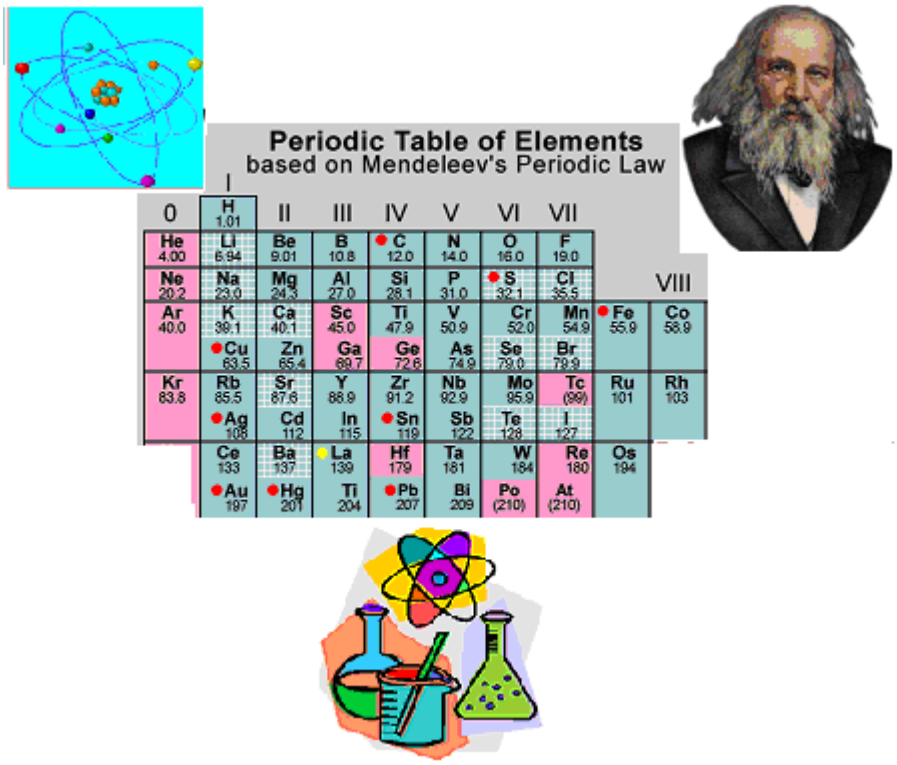
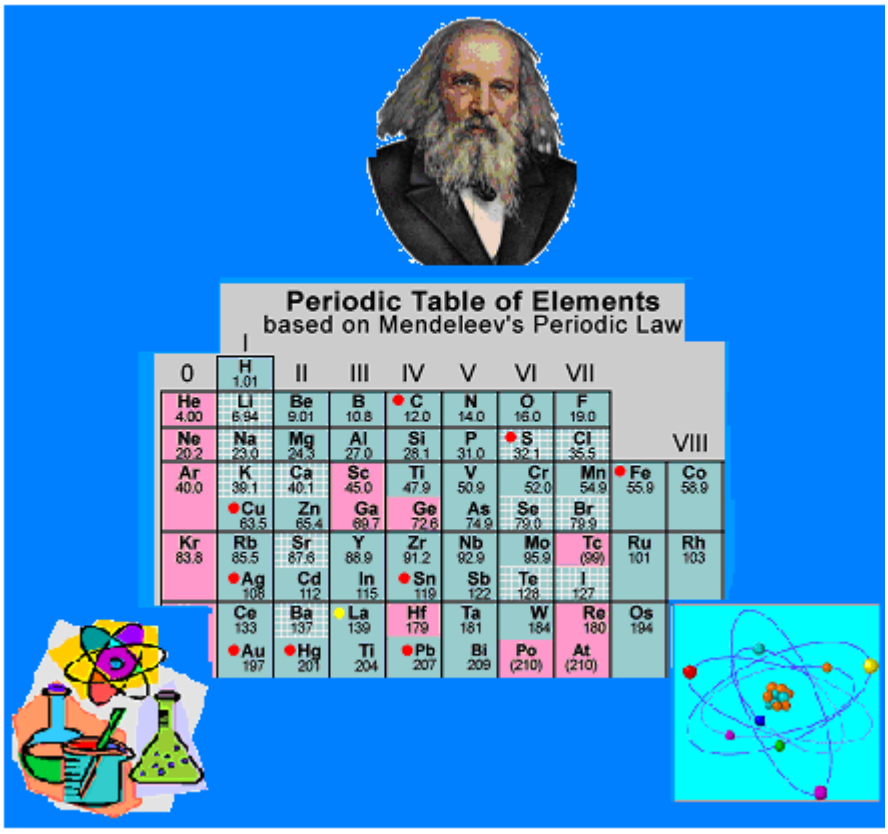
I. A.Abdugafurov, Sh.S.Alimov, A.I.Matkarimova

BASIC CHEMISTRY ELEMENTS





O’ZBEKISTON RESPUBLIKASI

OLIY VA O’RTA MAXSUS TA’LIM VAZIRLIGI

ZAHIRIDDIN MUHAMMAD BOBUR NOMIDAGI ANDIJON DAVLAT UNIVERSITETI

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CHEMISTRY ELEMENTS

Andijan – 2013

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KIMYOVIY ELEMENTLAR HAQIDA QISQACHA MA`LUMOT

Tartib №	Sim-voli	Inglizcha Nomi	Transkriptsiya	Ruscha nomi	O`zbekcha nomi	Kashf etilgan yili	Kashf etgan olim(lar)
1.	H	Hydrogen	‘haidridʒən	Водород	Vodorod	1766	Kavendish
2.	He	Helium	‘hi:liəm	Гелий	Geliy	1895	Ramzay va Kleve
3.	Li	Lithium	‘liΘiəm	Литий	Litiy	1817	Arfedson
4.	Be	Beryllium	Be’riliəm	Бериллий	Berilliy	1797	Voklen
5.	B	Boron	‘bɔ:rən	Бор	Bor	1808	Devi va Gey-Lyussak
6.	C	Carbon	‘kɑ:bən	Углерод	Uglerod	-	-
7.	N	Nitrogin	‘naitrədʒən	Азот	Azot	1772	Rezerford
8.	O	Oxygen	‘ɔksidʒən	Кислород	Kislorod	1174	Pristli va Sheyele
9.	F	Fluorine	‘fluərain	Фтор	Ftor	1886	Muassan
10.	Ne	Neon	‘niɔn	Неон	Neon	1889	Ramzay va Trevers
11.	Na	Sodium	‘səudjəm	Натрий	Natriy	1807	Devi
12.	Mg	Magnesium	‘mægnəzjəm	Магний	Magniy	1808	Devi
13.	Al	Aluminium	‚ælju’miniəm	Алюминий	Alyuminiy	1825	Ersted
14.	Si	Silicon	‘silikən	Кремний	Kremniy	1824	Berselius
15.	P	Phosphorus	‘fɔsfərəs	Фосфор	Fosfor	1669	Brand
16.	S	Sulphur	‘sʌlfə	Сера	Oltingugurt	-	-
17.	Cl	Chlorine	‘klɔ:ri:n	Хлор	Xlor	1774	Sheyele
18.	Ar	Argon	‘ɑ:gɔn	Аргон	Argon	1894	Ramzay va Reley
19.	K	Potassium	Pə’tæsiəm	Калий	Kaliy	1807	Devi
20.	Ca	Calcium	‘kælsiəm	Кальций	Kalsiy	1808	Devi
21.	Sc	Scandium	‘skændiəm	Скандий	Sksndiy	1879	Nilson
22.	Ti	Titanium	ti’tæniəm	Титан	Titan	1791	Gregor va Klaprot
23.	V	Vanadium	və’neidiəm	Ванадий	Vanadiy	1801	del Rio
24.	Cr	Chromium	‘krəumiəm	Хром	Xrom	1797	Voklen
25.	Mn	Manganese	‘mæŋgəni:z	Марганец	Marganes	1774	Gan
26.	Fe	Iron	‘aiən	Железо	Temir	-	-
27.	Co	Cobalt	kəu’bɔ:lt	Кобальт	Kobalt	1735	Brandt
28.	Ni	Nickel	‘nikl	Никель	Nikel	1751	Kronshtedt
29.	Cu	Copper	‘kɔpə	Медь	mis	-	-
30.	Zn	Zinc	Ziŋk	Цинк	Rux	-	-
31.	Ga	Gallium	‘gæliəm	Галлий	Galley	1875	de Buabodran
32.	Ge	Germanium	dʒə:’meiniəm	Германий	germaniy	1886	Vinkler
33.	As	Arsenic	‘ɑ:snik	Мышяк	mishyak	~1250	Buyuk Albert
34.	Se	Selenium	Se’leniəm	Селен	Selen	1817	Berselius
35.	Br	Bromaine	Brɔmein	Бром	Brom	1826	Balar
36.	Kr	Krypton	‘kriptɔn	Криптон	kriptnon	1898	Ramzay va Trevers
37.	Rb	Rubidium	‘ru:bidiəm	Рубидий	Rubidiy	1861	Bunzen va Kirxgof
38.	Sr	Strontium	strɔŋtiəm	Стронций	Stronsiy	1790	Krouford
39.	Y	Yttrium	Itriəm	Иттрий	Ittriy	1794	Gadolin
40.	Zr	Zirconium	zə:’kəuniəm	Цирконий	Sirkoniy	1789	Klaprot
41.	Nb	Niobium	nai’əubiəm	Ниобий	Niobiy	1801	Xetchett
42.	Mo	Molybdenum	Mə'lıbdənəm	Молибден	Molibden	1778	Sheyele
43.	Tc	Technetium	tek'ni:ʃıəm	Техниций	Texnisiy	1937	Perrye va Segra
44.	Ru	Ruthenium	Ru:'θi:nıəm	Рутений	Ruteniy	1844	Klaus
45.	Ro	Rhodium	'rəudıəm	Родий	Rodiy	1803	Uallaston
46.	Pd	Palladium	pə’leidiəm	Палладий	Palladiy	1803	Uallaston
47.	Ag	Silver	‘silvə	Серебро	Kumush	-	-
48.	Cd	Cadmium	‘kædmiəm	Кадмий	kadmiy	1817	Shtromeyyer
49.	In	Indium	‘indiəm	Индий	Indiy	1863	Rayx va Rixter
50.	Sn	Tin	‘tin	Олова	Qalay	-	-
51.	Sb	Antimony	‘æntimәni	Сурьма	Surma	-	-
52.	Te	Tellurium	Te‘luəriəm	Теллур	Tellur	1782	fon Reyxenshtayn
53.	I	Iodine	‘aiədi:n	Йод	Yod	1811	Kurtu
54.	Xe	Xenon	‘zenɔn	Ксенон	Ksenon	1898	Ramzay va Trevers
55.	Cs	Caesium	‘si:ziəm	Цезий	seziy	1860	Bunzen va Kirxgof
56.	Ba	Barium	‘bɛəriəm	Барий	Bariy	1808	Devi
57.	La	Lanthanum	‘lænΘənəm	Лантан	Latan	1839	Mosander
58.	Ce	Cerium	‘siəriəm	Церий	Seriy	1803	fon Xisinger va Berselius
59.	Pr	Praseodymium	ˌpreızıə'dımıəm	Празеодим	Prazeodim	1895	Auer fon Velsbax
60.	Ne	Neodymium	ˌni:əu'dımıəm	Неодим	Neodim	1895	Auer fon Velsbax
61.	Pm	Prometium	Prəu'mi: θıəm	Прометий	Prometiy	1945	Marunskiy va Gilendenin
62.	Sm	Samarium	Sə’meiriəm	Самарий	Samariy	1879	de Buabodran
63.	Eu	Yevropium	Juə'rəupıəm	Европий	Evropiy	1901	Demarse
64.	Gd	Gadolinium	‚gædə’liniəm	Гадолиний	Gadoliniy	1880	de Marinyak
65.	Tb	Terbium	‘tə:biəm	Тербий	Terbiy	1843	Mosander
66.	Dy	Disprozium	dıs'prəuzıəm	Диспрозий	Disproziy	1886	de Buabodran
67.	Ho	Holmium	'həulmıəm	Гольмий	Golmiy	1878	Sore
68.	Er	Erbium	‘ə:biəm	Эрбий	Erbiy	1842	Mosander
69.	Tm	Thulium	'θu:lıəm	Тулий	Tuliy	1879	Kleve

70.	**Yb**	**Ytterbium**	**ɪ'tɜːbɪəm**	**Иттербий**	**Itterbiy**	**1878**	**de Marinyak**
71.	**Lu**	**Lutetsium**	**Ljuː'tiːʃɪəm**	**Лютеций**	**Lyutetsiy**	**1907**	**Urben**
72.	**Hf**	**Hafnium**	**'hæfniəm**	**Гафний**	**Gafniy**	**1923**	**Koster va de Xeveshi**
73.	**Ta**	**Tantalum**	**'tæntələm**	**Тантал**	**Tantal**	**1802**	**Ekeberg**
74.	**W**	**Tungsten**	**'tʌŋstən**	**Вольфрам**	**Volfram**	**1783**	**Elyuyar**
75.	**Re**	**Rhenium**	**'riːnɪəm**	**Рений**	**Reniy**	**1925**	**Noddak ,Takke va Berg**
76.	**Os**	**Osmium**	**'ɔzmɪəm**	**Осмий**	**Osmiy**	**1803**	**Tennat**
77.	**Ir**	**Iridium**	**ɪ'rɪdɪəm**	**Иридий**	**Iridiy**	**1803**	**Tennat**
78.	**Pt**	**Platinum**	**'plætinəm**	**Платина**	**Platina**	**1557**	**Skaliger**
79.	**Au**	**Gold**	**'gəuld**	**Золото**	**Oltin**	**-**	**-**
80.	**Hg**	**Mercury**	**'məːkjuri**	**Ртуть**	**Simob**	**-**	**-**
81.	**Tl**	**Thallium**	**'Θæliəm**	**Таллий**	**Talliy**	**1861**	**Kruks**
82.	**Pb**	**Lead**	**'liːd**	**Свинец**	**Qo`rg`oshin**	**-**	**-**
83.	**Bi**	**Bismuth**	**'bizməƟ**	**Висмут**	**Vismut**	**1753**	**Joffrua**
84.	**Po**	**Polonium**	**Pə'ləuniəm**	**Полоний**	**Poloniy**	**1898**	**Mariya va Pyer Kyuri**
85.	**At**	**Astatine**	**'æstətiːn**	**Астат**	**Astat**	**1940**	**Korson, Makkenzi va Segre**
86.	**Rn**	**Radon**	**'reidɔn**	**Радон**	**Radon**	**1900**	**Dom**
87.	**Fr**	**Francium**	**'fræn(t)sɪəm**	**Франций**	**Fransiy**	**1939**	**Perey**
88.	**Ra**	**Radium**	**'reidiəm**	**Радий**	**Radiy**	**1898**	**Mariya va Pyer Kyuri**
89.	**Ac**	**Actinium**	**æk'tiniəm**	**Актиний**	**Aktiniy**	**1899**	**Debyern**
90.	**Th**	**Thorium**	**'θɔːrɪəm**	**Торий**	**Toriy**	**1829**	**Berselius**
91.	**Pa**	**Protactinium**	**ˌprəutæk'tɪnɪəm**	**Протактини**	**Protaktiniy**	**1917**	**Soddi, Kranston va Gan**
92.	**U**	**Uranium**	**Ju'reiniəm**	**Уран**	**Uran**	**1789**	**Klaport**
93.	**Np**	**Neptunium**	**nep'tju:niəm**	**Нептуний**	**Neptuniy**	**1940**	**Makmillan va Abelson**
94.	**Pu**	**Plutonium**	**pluː'təuniəm**	**Плутоний**	**Plutoniy**	**1940**	**Siborg**
95.	**Am**	**Americium**	**ˌæmə'rɪsɪəm**	**Америций**	**Amerisiy**	**1944**	**Siborg**
96.	**Cm**	**Curium**	**'kjuəriəm**	**Кюрий**	**Kyury**	**1944**	**Siborg**
97.	**Bk**	**Berkelium**	**bɜː'kiːlɪəm**	**Берклий**	**Berkliy**	**1949**	**Siborg**
98.	**Cf**	**Californium**	**ˌkælɪ'fɔːnɪəm**	**Калифорний**	**Kaliforniy**	**1950**	**Siborg**
99.	**Es**	**Einsteinium**	**ˌaɪn'staɪnɪəm**	**Эйнштейний**	**Eynshteyniy**	**1952**	**Siborg**
100.	**Fm**	**Fermium**	**'fɜːmɪəm**	**Фермий**	**Fermiy**	**1952**	**Siborg**
101.	**Md**	**Mendelevium**	**ˌmend(ə)l'iːvɪəm**	**Менделевий**	**Mendeleviy**	**1955**	**Siborg**
102.	**No**	**Nobelium**	**nəu'biːlɪəm**	**Нобелий**	**Nobeliy**	**1958**	**Siborg**
103.	**Lr**	**Lawrencium**	**lə'ren(t)sɪəm**	**Лоуренсий**	**lourensiy**	**1961**	**Giorso**
104.	**Rf**	**Rutherfordium**	**ˌrʌðə'fɔːdɪəm**	**Резерфордий**	**Rezerfordiy**	**1964/ 69**	**Flyerov**
105.	**Db**	**Dubnium**	**'dʌbnɪəm**	**Дубний**	**Dubniy**	**1967/ 70**	**Flyerov**
106.	**Sg**	**Seaborgium**	**'siːbɔːgɪəm**	**Сиборгий**	**Siborgiy**	**1974**	**Flyerov**
107.	**Bh**	**Bohrium**	**'bɔrɪəm**	**Борий**	**Boriy**	**1976**	**Ogonesyan**
108.	**Hs**	**Hassium**	**'hæsɪəm**	**Хассий**	**Xassiy**	**1984**	
109.	**Mt**	**Meitnerium**	**ˌmaɪt'nɪərɪəm**	**Мейтнерий**	**Meytneri**	**1982**	
110.	**Ds**	**Darstadtium**	**'darʃtadtiəm**	**Дармштадтий**	**Darmshtadtiy**	**1994**	
111.	**Rg**	**Roentgenium**	**rʌntˈdʒɛnɪum, rəːnt-, rɒnt-, -ˈgɛn-**	**Рентгений**	**Rentgeniy**	**1994**	
112.	**Cn**	**Copernicium**	**kə'pɜːnɪkəm**	**Коперниций**	**Kopernitsiy**	**1996**	
113.	**Uut**	**Ununtrium**	**ʌnʌn'ɪtrɪəm**	**Унунтрий**	**Ununtriy**	**2004**	
114.	**Uuq**	**Ununquadium**	**ʌnʌn'qwɑːdiəm**	**Унунквадий**	**Ununkvadiy**	**1999**	
115.	**Uup**	**Ununpentium**	**ʌnʌn'pentiəm**	**Унунпентий**	**Ununpentiy**	**2004**	
116.	**Uuh**	**Ununhexium**	**ʌnʌn'geksiəm**	**Унунгексий**	**Unungeksiy**	**1999**	
117.	**Uus**	**Ununseptium**	**ʌnʌn'septəm**	**Унунсептий**	**Ununseptiy**	**2010**	
118.	**Uuo**	**Unonoctium**	**ʌn'ɔnɔktiəm**	**Унуноктий**	**Ununoktiy**	**2004**	

So’z boshi

Bugungi kunda jahon miqyosida kechayotgan globallashuv va integrallashuv jarayonlari mamlakatlar o‘rtasidagi har tomonlama aloqalarni o’sishiga, rivojlanishiga olib keladi va xorijiy tillarni muloqot tili sifatidagi rolini yanada ortishiga sabab bo’ldi.

O’zbekiston Respublikasi Prezidentining "Chet tillarni o’qitish tizimini yanada takomillashtirish chora-tadbirlari" to’g’risidagi qarori aynan ana shu dolzarb masalani yechimiga qaratilganligi bilan ham muhim ahamiyat kasb etadi. Bu qaror o’z navbatida jamiyatning turli sohalari uchun mutaxassislar tayyorlashga ma’sul bo’lgan o’rta maxsus va oliy ta’lim tizimidagi o’quv muassasalarida ishlayotgan xorijiy til o’qituvchilari zimmasiga ma’suliyatli vazifa yuklaydi.

Hozirda jahon standartlari talablariga javob beradigan malakali mutaxassisdan nafaqat bir, balki bir necha xorijiy tilni bilishi talab etilmoqda. Bu esa turli sohadagi kasb egalariga xorijiy manbalardan o’zlarining kasblariga oid materiallarni o’qib-o’rganib, og’zaki va yozma axborot olish, xorijiy tajribani o’rganish va ulardan o’zlarining kasbiy faoliyatlarida foydalana bilish imkoniyatini yaratadi.

E’tiboringizga havola etilayotgan ushbu qo’llanma kimyo fakul’teti talabalariga mo’ljallangan bo’lib, unda kimyoviy elementlarning har biriga mos keluvchi, ularning kimyoviy xossalari, sanoatda ishlatilishi bilan bog’liq axborotlarni o’z ichiga olgan matnlar berilgan. Har bir kimyoviy elementga bir matn va bir dars ajratilgan. Qo’llanma jami 31 darsni o’z ichiga olgan. Barcha darslardagi o’quv materiallari ma’lum ketma-ketlikda berilgan bo’lib, ular matnni o’qib-tushunishni osonlashtirishga qaratilgan kalit so’zlar, matn yuzasidan berilgan topshiriqlar, savollar, seanslar va test topshiriqlarini o’z ichiga olgan.

Har bir darsda keltirilgan seanslar shu darsda berilgan kimyoviy elementni gaplarda qo’llashni osonlashtiruvchi avval o’zbekcha gap, keyin esa aynan shu gapning inglizcha tarjimasi keltirilgan. Ular o’rganilayotgan o’quv materialini mustahkamlashga va amaliyotda qo’llashga yordam beradi. Dars yakunida keltirilgan testlar ushbu darsda o’rganilgan o’quv materialini talabalar tomonidan o’zlashtirilish darajasini, talabalarning ingliz tilidagi nutqiy ko’nikma va malakalarini qay darajada shakllanganligini baholash imkonini beradi.

Ushbu qo’llanmadan dars jarayonida, shuningdek, talabalarning mustaqil ishlarini tashkil qilishda ham foydalanish mumkin.

Uslubiy ko’rsatma

Ushbu qo’llanmadan foydalanish jarayonida quyida keltirilgan ko’rsatmalarga amal qilish kimyo fakul’teti talabalarining ingliz tilini o’rganishlarida shu tilga nisbatan qiziqish, istak-xohish uyg’otibgina qolmasdan, ularning kimyo o’qituvchisi sifatidagi kasbiy bilimlarini chuqurlashtirish va kasbiy mahoratlarini o’stirishga ham yordam beradi.

1. Matnda keltirilgan notanish so’zlarni daftaringizga yozib oling va ularni tarjima qiling.

2. Matnlarda keltirilgan grammatik materialni o’rganish alohida ajratib ko’rsatilmagan. Ular zarurat bo’lgan holda o’qituvchi tomonidan izohlab beriladi.

3. Matnni o’qib chiqing va mazmunini tushunib olishga harakat qiling.

4. Berilgan savollarga matndan foydalanib javob bering.

5. Mashqlarni berilgan ketma-ketlikda bajaring.

6. Seans ichidagi gaplarni o’zbekchasini o’qing, so’ng aynan shu gapning inglizcha muqobilini o’qib, ularni solishtirib ko’ring va eslab qolishga harakat qiling.

7. Gaplarni ikkinchi bor o’qishda ularning inglizcha berilgan muqobiliga qaramasdan, ingliz tiliga tarjima qilishga harakat qiling. Agar qiynalib qolsangiz yana ingliz tilida berilgan gapni o’qing va yoddan chiqqan so’zlarga e’tibor bering.

8. O’zingizning bilim darajangiz va xotirangizdan kelib chiqib, ushbu mashqni bir necha bor takrorlashingiz mumkin. Bunday mashg’ulot matnni eslab qolish va yoddan aytib berishni osonlashtiradi.

9. Ushbu seansda berilgan gaplarni diktant-tarjima usulida yozishni mashq qilish bu gaplarni tushunib, yodlab olishni osonlashtiradi.

10. Har bir darsda berilgan matn ustida ishlash, matn mazmunini aytib berish, o’qituvchining savollariga javob berish yoki matn mazmunini yozib berish, boshqacha qilib aytganda, o’rganilayotgan kimyoviy element haqida bilganlarini yozib berish bilan yakunlanadi.

TEXT ONE: H Y D R O G E N

Hydrogen- H -(Gr. hydro, water, and genes, forming). Hydrogen was prepared many years before it was recognized as a distinct substance by Cavendish in 1776. Named by Lavoisier, hydrogen is the most abundant of all elements in the universe, and it is thought that the heavier elements were, and still are, being built from hydrogen and helium. Hydrogen is estimated to make up more than 90% of all the atoms or three quarters of the mass of the universe. This element is found in the sun and most stars, and plays an important part in the proton-proton reaction and carbon-nitrogen cycle, which accounts for the energy of the sun and stars. Hydrogen is thought to be a major component of Jupiter and that at some depth in the planet's interior the pressure is so great that solid molecular hydrogen is converted to solid metallic hydrogen. In 1973, a group of Russian experimenters may have produced metallic hydrogen at a pressure of 2.8 Mbar. At the transition the density changed from 1.08 to 1.3 g/cm^3. Earlier, in 1972, a Livermore, California, a group also reported on a similar experiment in which they observed a pressure-volume point centered at 2 Mbar. Predictions say that metallic hydrogen may be metastable; others have predicted it would be a superconductor at room temperature. On earth, hydrogen occurs chiefly in combination with oxygen in water, but it is also present in organic matter such as living plants, petroleum, coal, etc. It is present as the free element in the atmosphere, but only to the extent of less than 1 ppm by volume. The lightest of all gases, hydrogen combines with other elements -- sometimes explosively -- to form compounds. Great quantities are required commercially for the fixation of nitrogen from the air in the Haber ammonia process and for the hydrogenation of fats and oils. It is also used in large quantities in methanol production, in hydrodealkylation, hydrocracking, and hydrodesulfurization. Other uses include rocket fuel, welding, producing hydrochloric acid, reducing metallic ores, and filling balloons. The lifting power of 1 ft 3 of hydrogen gas is about 0.07 lb at ^{o} C, 760 mm pressure. Production of hydrogen in the U.S. alone now amounts to about 3 billion cubic feet per year.

Hydrogen is prepared by steam on heated carbon, decomposition of certain hydrocarbons with heat, action of sodium or potassium hydroxide on aluminum electrolysis of water, or displacement from acids by certain metals. Liquid hydrogen is important in cryogenics and in the study of superconductivity, as its melting point is only 20 degrees above absolute zero. Tritium is readily produced in nuclear reactors and is used in the production of the hydrogen bomb. It is also used as a radioactive agent in making luminous paints, and as a tracer. Consideration is being given to an entire economy based on solar- and nuclear-generated hydrogen. Public acceptance, high capital investment, and the high cost of hydrogen with respect to today's fuels are but a few of the problems facing such an economy. Located in remote regions, power plants would electrolyze seawater; the hydrogen produced would travel to distant cities by pipelines. Pollution-free hydrogen could replace natural gas, gasoline, etc., and could serve as a reducing agent in metallurgy, chemical processing, refining, etc. It could also be used to convert trash into methane and ethylene. Heavy water, deuterium oxide (D_2O) is used as a moderator to slow down neutrons. The ordinary isotope of hydrogen, H[1], is known as Protium, the other two isotopes are Deuterium (H[2]) and Tritium (H[3]). Hydrogen is the only element whose isotopes have been given different names. Deuterium and Tritium are both used as fuel for nuclear fusion reactors. Normal hydrogen contains 0.017% (1/6000) Deuterium. Deuterium is used as a moderator to slow down neutrons. Tritium atoms are also present but in much smaller proportions. Tritium is readily produced in nuclear reactors and is used in the production of the hydrogen (fusion) bomb. It is also used as a radioactive agent in making luminous paints, and as a tracer.

G L O S S A R Y

was prepared- готовить - tayyorlamoq, tayyorlandi

distinct substance- субстанция, реальность - aniq substansiya

elements- элемент - element

were built from hydrogen- водород - vodoroddan tarkib topgan

proton-proton reaction- протон реакция - proton reaksiyasi

the pressure- давление - bosim

solid metallic hydrogen- твердый металлический водород - qattiq metalsimon vodorod

observe- замечать - kuzatmoq

occur- происходить - sodir bo'lmoq, yuz bermoq

oxygen- кислород - kislorod

to be present- присутствовать - qatnashmoq

living plant – живая плантация - tirik o'simlik

petroleum- нефть - neft

by volume- по объёму - hajmiga (sig'imiga) ko'ra

explosively- взрывной - portlovchi

hydrodealkylation – гидроделкулация - gidrodelkilatsiya

hydrocracking- гидрокрекинг - gidrokreking

hydrodesulfurization- гидродесульфурация - idrodesul'furatsiya

rocket fuel- ракетное топливо - raketa yoqilg'isi

welding- сварка - payvandlash

welding of pipes in fixed position –trubalarni payvandlash

welding of pipes into section – trubalarni seksiyalarga payvandlash

producing hydrochloric acid – gidroxlorik kislota ishlab chiqish

reducing metallic ores - редуцирующий металлсодержащая руда - redutsiyalashgan metalli ruda

filling balloons- наполнение шар - sharni to'ldirmoq

cryogenics- физика низких температур, криогеника - kriogenika, past harorat fizikasi

luminous paints – светяшийеся краски - yaltirab turuvchi bo'yoqlar

pipelines- трубопровод (нефтепровод, паропровод, газопровод) - quvur (neft quvuri, bug'quvuri, gaz quvuri)

moderator- замедлитель (ядерных реакций) - sekinlashtiruvchi

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

a) What does hydrogen consist of?

b) Where is usually hydrogen found?

c) In combination of what does the hydrogen occur?

d) How is it present in the atmosphere?

e) When and by whom was hydrogen prepared?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Og'ir elementlar vodorod va geliydan hosil bo'ladi.	- Heavier elements are built from hydrogen and helium.
2. Bu element quyoshda va ko'pchilik yulduzlarda uchraydi.	- This element is found in the sun and most stars.
3. Vodorod koinotdagi eng ko'p uchraydigan element.	- Hydrogen is the most abundant element in the universe.
4. Katta bosim ostida vodorod molekulasi qattiq metallik vodorodga aylanadi.	- Under higher pressure molecular of hydrogen is converted to solid metallic hydrogen.
5. Vodorod yer yuzida asosan suvdagi kislorod tarkibida uchraydi.	- Hydrogen chiefly occurs in combination with oxygen in water on earth.

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6. Vodorod barcha gazlardan yengil hisoblanadi.	- Hydrogen is the lightest of all gases.
7. U metanol ishlab chiqishda ham ishlatiladi.	- It is used in methanol production too.
8. Vodorod raketa yoqilg'isi va gidroxlorik kislota ishlab chiqishda ham qo'llanadi.	- Hydrogen is also used as a rocket fuel and in production hydrochloric acid.
9. AQSHda yiliga uch million kub vo-	– Every year three billion cubic

dorod ishlab chiqiladi.

10. Suyuq vodorod kriogenikada muhim rol o'ynaydi. - Liquid hydrogen is important in cryogenics.

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11. Tritium yadro reaktorlarida oson ishlab chiqariladi. - Tritium is readily produced in nuclear reactors.

12. U yadro bombasi tayyorlashda foydalaniladi. - It is used in production of the hydrogen bomb.

13. Tritium radioaktiv agent sifatida ham ishlatiladi. -Tritium is also used as radioactive agent.

14. Ekologik toza vodorod gaz va benzonning o'rniga ishlatilishi mumkin. - Pollution free hydrogen could replace gas and gasoline.

15. Vodorod kimyoviy jarayonlarda sekinlashtiruvchi agent sifatida qo'llanishi mumkin. - Hydrogen can be used as a reducing agent in chemical processing.

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16. Vodorod chiqindilarni metan va etilenga aylantirishda ham ishlatiladi. - Hydrogen is also used to convert trash into methane and ethylene.

17. Og'ir suv bu deyterium oksiddir (O_2O) – Heavy water is denterium oxid (O_2O)

18. Vodorodning oddiy izotopi H [1] protium deb ham ataladi. - The ordinary isotope of hydrogen is known as protium.

19. Vodorod o'zining izotoplariga turlicha nom berilgan yagona element. - Hydrogen is the only element the isotopes of which is given different names.

20. Normal vodorodda 0,017% deytrium mavjud. - Normal hydrogen contains 0,017% deuterium.

5. Tests (Тестлар)

What does hydrogen consist of?

a) hydro, water, geans

b) hydro, petroleum, oxygen

c) water, acid, metal

Where is usually hydrogen found?

a) hydrogen is found in the sun and most stars

b) hydrogen is found in the lake

c) hydrogen is found in the sea and ocean

In combination of what does the hydrogen occur?

a) hydrogen occurs chiefly in combination with oxygen in water

b) hydrogen occurs chiefly in combination with oxygen

c) hydrogen occurs chiefly in combination with water

How is it present in the atmosphere?

a) It is present as the free element in the atmosphere, but only to the extent of less than 1 ppm by volume

b) It is present as the only element in the atmosphere, but only to the extent of less than 1 ppm by volume

c) It is present as the basic element in the atmosphere

When and by whom was hydrogen prepared?

a) Hydrogen was prepared many years before it was recognized as a distinct substance by Cavendish in 1776

b) Hydrogen was prepared many years before it was recognized as a distinct substance by Mendeleyev in 1766

c) Hydrogen was prepared many years before it was recognized as a distinct substance by Cavendish in 1770

TEXT TWO: HELIUM

Helium- He (Gr. helios, the sun). A light, odorless, colorless, tasteless inert gas. Janssen obtained the first evidence of helium during the solar eclipse of 1868 when he detected a new line in the solar spectrum. Lockyer and Frankland suggested the name helium for the new element. In 1895 Ramsay discovered helium in the uranium mineral clevite while it was independently discovered in cleveite by the Swedish chemists Cleve and Langlet at about the same time.

Rutherford and Royds in 1907 demonstrated that alpha particles are helium nuclei. Except for hydrogen, helium is the most abundant element found through out the universe. Helium is extracted from natural gas. In fact, all natural gas contains at least trace quantities of helium. It has been detected spectroscopically in great abundance, especially in the hotter stars, and it is an important component in both the proton-proton reaction and the carbon cycle, which account for the energy of the sun and stars. The fusion of hydrogen into helium provides the energy of the hydrogen bomb. The helium content of the atmosphere is about 1 part in 200,000. Helium is present in various radioactive minerals as a decay product. Helium has the lowest melting point of any element and is widely used in cryogenic research because its boiling point is close to absolute zero. Also, the element is vital in the study of super conductivity. Using liquid helium, Kurti and co-workers and others, have succeeded in obtaining temperatures of a few microkelvins by the adiabatic demagnetization of copper nuclei. It has other peculiar properties. Helium is the only liquid that cannot be solidified by lowering the temperature. It remains liquid down to absolute zero at ordinary pressures, but it can readily be solidified by increasing the pressure. Solid He[3] and He[4] are unusual in that both can be changed in volume by more than 30% by applying pressure. The specific heat of helium gas is unusually high. The density of helium vapor at the normal boiling point is also very high, with the vapor expanding greatly when heated to room temperature. Containers filled with helium gas at 5 to 10 K should be treated as though they contained liquid helium due to the large increase in pressure resulting from warming the gas to room temperature. While helium normally has a 0 valence, it seems to have a weak tendency to combine with certain other elements. Means of preparing helium difluoride have been studied, and species such as HeNe and the molecular ions He+ and He++ have been investigated. Seven isotopes of helium are known: Liquid helium (He[4]) exists in two forms: He[4](I) and He[4](II), with a sharp transition point at 2.174K. He[4](I) (above this temperature) is a normal liquid, but He[4](II) (below it) is unlike any other known substance. It expands on cooling; its conductivity for heat is enormous; and neither

its heat conduction nor viscosity obeys normal rules. Helium gas is used as an inert/protective gas shield for: arc welding, supersonic wind tunnels, growing of silicon and germanium crystals and producing titanium and zirconium. A mixture of helium and oxygen is used as an artificial atmosphere for divers and others working under pressure. Different ratios of He/O_2 are used for different depths at which the diver is operating. Helium is also used as a cooling medium for nuclear reactors. Helium is extensively used for filling balloons as it is a much safer gas than hydrogen. Liquid helium's use in magnetic resonance imaging (MRI) continues to increase as the medical profession accepts and develops new uses for the equipment. This equipment has eliminated some need for exploratory surgery by accurately diagnosing patients. Another medical application uses MRE to determine (by blood analysis) whether a patient has any form of cancer. Helium is also being used to advertise on blimps for various companies, including Goodyear. Other lifting gas applications are being developed by the Navy and Air Force to detect low-flying cruise missiles. Helium-filled balloons has been used to sample the atmosphere in Antarctica to determine what is depleting the ozone layer.

G L O S S A R Y

helium – гелий - geliy

solar eclipse- солнечное затмение - quyoshda qizirish

solar spectrum- солнечный спектр - quyosh spektri

cleveite - клевеит, нивенит (разновидность уранинита) - klevenit

difluoride - дифторид - diftorid

supersonic wind tunnels – сверхзвуковая аэродинамическая труба - past ovozli aerodinamik truba

growing of silicon – возрастающий (поднимающиеся) кремний - o'stiruvchi (rivojlantiruvchi) kremniy

germanium crystals – германий кристалл - germaniyli kristal

producing titanium and zirconium – производящий титан и цирконий – titan va tsirkoniy ishlab chiqarish

ratios – отношение - munosabat

safer gas – безопасный газ - xavfsiz gaz

resonance – резонанс, гул - rezonans

cancer – рак, тропик рака - rak

blimps – аэростат - aerostat

low-flying cruise missiles – низколетящих крылатых ракет - past uchuvchi raketa

depleting the ozone layer – снятия озоновой слой - ozon qatlamini olib tashlash

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is helium?

Who suggested the name of helium for the new element? And when?

What is extracted from natural gas?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Geliy yengil, hidsiz, rangsiz, mazasiz inert gaz.	Helium is light, odorless, colorless, tasteless inert gas.
2. U ilk bor 1868 yil quyosh tutilishi paytida aniqlangan.	It was first obtained during the solar eclipse in 1868.
3. Yansen quyosh spektrida yangi chiziqni kashf etdi.	Jaussen detected a new line in the solar spectrum.
4. Lokiyer va Frankland yangi elementga geliy nomini berishni taklif qilishdi.	Lockyer and Frankland suggested the name helium for the new element.
5. Vodoroddan tashqari geliy koinotda eng ko'p uchraydigan element hisoblanadi.	Except for hydrogen helium is the most abundant element in the universe.

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6. Geliy tabiiy gazdan olinadi.	Helium is extracted from natural

gas.

7. Geliyning vodorod bilan qo’shilishi vodorod bombasining energiyasini beradi.	The fusion of helyium with hydrogen provides the energy of hydrogen bomb.
8. Geliy turli radioaktiv minerallar tarkibida uchraydi.	Helium is presented in various radioactive minerals.
9. Geliyning qaynash chegarasi absolyut nolga yaqin.	The boiling point of helium is close to absolute zero.
10. Geliy haroratini pasaytirish orqali qotirib bo’lmaydigan yagona suyuqlik.	Helium is the only liquid that can not be solidifired by lowering the temperature.

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11. Geliyning ettita izotopi ma’lum.	Seven isotopes of helium are known.
12. Suyuq geliy (He[4]) ikki shakldagi ko’rinishga ega.	Liquid helium (He[4]) exists in two forms.
13. Geliy sovutilganda kengayadi.	Helium expands on cooling.
14. Uning issiqlik o’tkazuvchanligi juda katta.	It’s conductivity for heat is enormous.
15. Geliyning kislorod bilan aralashmasi sun’iy atmosfera hosil qilishda ishlatiladi.	A mixture of helium is used as an artificial atmosphere.

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16. Bunday sun’iy atmosfera suvga sho’ng’uvchilar uchun kerak.	Such artificial atmosphere is for divers.
17. Bunday sun’iy atmosfera bosim ostida ishlayotganda kerak.	Such artificial atmosphere is important while working under pressure.
18. Geliy yadro reaktorlarini sovutish uchun ham kerak.	Helium is used for cooling nuclear reactors.
19. Geliy balonlarni to’ldirish uchun ham	Helium is used for filling balloons.

ishlatiladi.

20. U vodorodga qaraganda anchagina xavfsiz gaz.	It is a much safer gas than hydrogen.

TEXT THREE: OXYGEN

Oxygen- O (Gr. oxys, sharp, acid, and genes, forming; acid former). For many centuries, workers occasionally realized air was composed of more than one component. The behavior of oxygen and nitrogen as components of air led to the advancement of the phlogiston theory of combustion, which captured the minds of chemists for a century. Oxygen was prepared by several workers, including Bayen and Borch, but they did not know how to collect it, did not study its properties, and did not recognize it as an elementary substance. Priestley is generally credited with its discovery, although Scheele also discovered it independently. Its atomic weight was used as a standard of comparison for each of the other elements until 1961 when the International Union of Pure and Applied Chemistry adopted carbon 12 as the new basis. Oxygen is the third most abundant element found in the sun, and it plays a part in the carbon-nitrogen cycle, the process once thought to give the sun and stars their energy. Oxygen under excited conditions is responsible for the bright red and yellow-green colors of the Aurora. A gaseous element, oxygen forms 21% of the atmosphere by volume and is obtained by liquefaction and fractional distillation. The atmosphere of Mars contains about 0.15% oxygen. The element and its compounds make up 49.2%, by weight, of the earth's crust. About two thirds of the human body and nine tenths of water is oxygen. In the laboratory it can be prepared by the electrolysis of water or by heating potassium chlorate with manganese dioxide as a catalyst. The gas is colorless, odorless, and tasteless. The liquid and solid forms are a pale blue color and are strongly paramagnetic. Ozone (O_3), a highly active compound, is formed by the action of an electrical discharge or ultraviolet light on oxygen. Ozone's presence in the atmosphere (amounting to the equivalent of a layer 3 mm thick under ordinary pressures and temperatures) helps prevent harmful ultraviolet rays of the sun from reaching the

earth's surface. Pollutants in the atmosphere may have a detrimental effect on this ozone layer. Ozone is toxic and exposure should not exceed 0.2 mg/m# (8-hour time-weighted average - 40-hour work week). Undiluted ozone has a bluish color. Liquid ozone is bluish black and solid ozone is violet-black. Oxygen, which is very reactive, is a component of hundreds of thousands of organic compounds and combines with most elements. Plants and animals rely on oxygen for respiration. Hospitals frequently prescribe oxygen for patients with respiratory ailments. Oxygen has nine isotopes. Natural oxygen is a mixture of three isotopes. Natural occurring oxygen-18 is stable and available commercially, as is water (H_2O with 15% O[18]). Oxygen enrichment of steel blast furnaces accounts for the greatest use of the gas. Large quantities are also used in making synthesis gas for ammonia and methanol, ethylene oxide, and for oxy-acetylene welding. Air separation plants produce about 99% of the gas, while electrolysis plants produce about 1%.

G L O S S A R Y

oxygen – кислород - kislorod

occasionally – иногда - ba'zan

advancement – продвижение - ilgarilash

the phlogiston theory of combustion – теории флогистона сгорания - yonishning flogiston nazariyasi

abundant element – распространенный элемент - ko'p tarqalgan element

obtained by liquefaction – полученные по сжижению - yoqish orqali olingan

fractional distillation – фракционная перегонка - fraksiyali haydash, ajratib olish

heating potassium chlorate – отопление хлората калия - kaliy xloratni qizdirish

pollutants – загрязнителей - loyqalantiruvchilar

potassium chlorate - хлората калия - kaliy xlorit

respiratory ailments – заболевания органов дыхания - nafas organlarini kasallanishi

isotopes – изотопы - izotoplar

steel blast furnaces - сталь доменных печей - po'lat quyuvchi domna pechkalar

oxy-acetylene welding – кислородно-ацетиленовой сварки - kislorod-atsetalli payvandlash

air separation - разделения воздуха - havoning ajralishi

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

1. What captured the minds of chemists?
2. What are the names of the people who have made discoveries?
3. What color is oxygen responsible in Aurora?
4. What do you need for perpetrating oxygen in the laboratory?
5. For what is oxygen needed?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Season o'zbekcha - inglizcha 20 ta

1. Havo birdan ortiq komponentdan tashkil topgan.	- The air is composed of more than one component.
2. Bu flagiston nazariyasini kelib chiqishiga sabab bo'ldi.	- It led to the advancement of phlogiston theory.
3. Kislorod Bayen, Borx va boshqa ko'p olimlar tomonidan o'rganilgan.	- Oxygen was studied by Bayen, Borch and many other scientists.
4. Pristli kislorodning kashfiyotchisi deb tan olingan	- Priestley was credited with discovery of oxygen.
5. Boshqa bir olim Shile ham mustaqil holda kislorodni kashf qilgan.	- The other scientist Scheele also discovered oxygen independently.
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6. Kislorod bir necha olimlar tomonidan kashf qilingan.	– Oxygen was discovered by several scientists.
7. Gazsimon element bo'lgan kislorod havoning 21 foizini tashkil qiladi.	- A gaseous element, oxygen forms 21% of the atmosphere.
8. Marsning atmosferasida15% kis-	– The atmosphere of Mars contains

lorod bor. 15% of Oxygen.

9. Kislorod rangsiz, hidsiz va ta'm- siz gaz. - Oxygen is colorless, odorless and tasteless gas.

10. Laboratoriya sharoitida kislorod suvdan elektroliz yordamida hosil qilinadi. - In the laboratory the Oxygen can be prepared by the electrolysis of water.

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11. Ozon elektrlantirish harakatlari orqali hosil qilinadi. - Ozone is formed by the action of an electrical discharge.

12. Ozon zararli ultra siyohrang nurlardan saqlanishga yordam beradi. – Ozone helps to prevent harmful ultraviolet rays.

13. Atmosferadagi polutantlar (zararli zarralar) ozon qatlamiga zarar yetkazishi mumkin. - Pollutants in the atmosphere may have detrimental effect on the ozone layer.

14. Suyultirilmagan ozon ko'kish rangga ega. - Undiluted ozone has a bluish color.

15. Suyiltirilgan ozon ko'kimtir qora rangga ega. - Liquid ozone is bluish black.

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16. Qattiq ozon siyohrang qora rangda bo'ladi. - Solid ozone is violet black.

17. Kislorod bir qancha organik birikmalarning komponentidir. - Oxygen is a component of several compounds.

18. O'simliklar va hayvonlarga nafas olish uchun kislorod kerak. - Plants and animals rely on oxygen for respiration.

19. Kislorodning 9 ta izotopi bor. – Oxygen has nine isotopes.

20. Tabiiy kislorod uch izotopning qorishmasidir. - Natural oxygen is a mixture of three isotopes.

TEXT FOUR: NITROGEN

Nitrogen- N (L. nitrum, Gr. Nitron, native soda; genes, forming). Nitrogen was discovered by chemist and physician Daniel Rutherford in 1772. He removed oxygen and carbon dioxide from air and showed that the residual gas would not support combustion or living organisms. At the same time there were other noted scientists working on the problem of nitrogen. These included Scheele, Cavendish, Priestley, and others. They called it "burnt or dephlogisticated air" which meant air without oxygen. Nitrogen gas (N_2) makes up 78.1% of the Earth's air, by volume. The atmosphere of Mars, by comparison, is only 2.6% nitrogen. From an exhaustible source in our atmosphere, nitrogen gas can be obtained by liquefaction and fractional distillation. Nitrogen is found in all living systems as part of the makeup of biological compounds. The French chemist Antoine Laurent Lavoisier named nitrogen azote, meaning without life. However, nitrogen compounds are found in foods, fertilizers, poisons, and explosives. Nitrogen, as a gas is colorless, odorless, and generally considered an inert element. As a liquid (boiling point = minus 195.8^{o}C), it is also colorless and odorless, and is similar in appearance to water. Nitrogen gas can be prepared by heating a water solution of ammonium nitrate (NH_4NO_3). Sodium nitrate ($NaNO_3$) and potassium nitrate (KNO_3) are formed by the decomposition of organic matter with compounds of these metals present. In certain dry areas of the world these saltpetre are found in quantity and are used as fertilizers. Other inorganic nitrogen compounds are nitric acid (HNO_3), ammonia (NH_3), the oxides (NO, NO_2, N_2O_4, N_2O), cyanides (CN-), etc. The nitrogen cycle is one of the most important processes in nature for living organisms. Although nitrogen gas is relatively inert, bacteria in the soil are capable of "fixing" the nitrogen into a usable form (as a fertilizer) for plants. In other words, Nature has provided a method to produce nitrogen for plants to grow. Animals eat the plant material where the nitrogen has been incorporated into their system, primarily as protein. The cycle is completed when other bacterial convert the waste nitrogen compounds back to nitrogen gas. Nitrogen has become crucial to life being a component of all proteins. Ammonia (NH_3) is the most important

commercial compound of nitrogen. It is produced by the Haber Process. Natural gas (methane, CH_4) is reacted with steam to produce carbon dioxide and hydrogen gas (H_2) in a two step process. Hydrogen gas and nitrogen gas are then reacted in the Haber Process to produce ammonia. This colourless gas with a pungent odour is easily liquefied. In fact, the liquid is used as a nitrogen fertilizer. Ammonia is also used in the production of urea, NH_2CONH_2, which is used as a fertilizer, in the plastic industry, and in the livestock industry as a feed supplement. Ammonia is often the starting compound for many other nitrogen compounds.

G L O S S A R Y

nitrogen – азот - azot

carbon dioxide – двуокись углерода - uglerod oksidi

residual gas – остаточный газ - qoldiq gaz

combustion – сгорание - yonish

burnt or dephlogisticated air – сожженый или дефлогистированный воздух - yondirilgan gaz yoki deflogistirlangan havo

exhaustible source – исчерпаемы источник - tugatayotgan manba

liquefaction – сжижению - yondirish (yoqish)

fractional distillation – фракционная перегонка - fraksiyali haydash, ajratib olish

odourless – без запаха - hidsiz

inert element - инертного элемента - inert element

ammonium nitrate – аммиачная селитра - ammiak selitrasi

sodium nitrate – нитрат натрия - natriy nitrat

potassium nitrate – нитрат калия - kaliy nitrat

saltpetre- селитры - selitra

fertilizers – удобрения - o'g'itlar

primarily- в первую очередь - birinchi navbatda, avvalo

crucial- решающее значение - hal qiluvchi ahamiyat

ammonia – аммиак - ammiak

a pungent odor - острый запах - o'tkir hid

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

1. When and by whom was Nitrogen prepared?
2. What names of scientist who working of the problem of Nitrogen?
3. What does it mean " burnt or dephologisticated air"?
4. Who was named the Nitrogen to Azot?
5. What does the word Azot means?
6. How nitrogen gas can be prepared?
7. What is the " Haber Process"?
8. Where does Ammonia is used?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Nitrogen kim tomonidan kashf qilingan? – Whom was nitrogen discovered?
2. Nitrogen qachon kashf qilingan? - When was nitrogen discovered?
3. Daniel Ruterbord kislorod va karbon kislotani havodan olgan. - Daniel Rutherbord removed oxygen and carbon dioxide from air.
4. O'sha davrda azot muammosi ustida boshqa olimlar ham ish olib borgan. - At that time the other scientists also worked on the problem nitrogen.
5. Ular azotni "kuydirilgan yoki deflogistirlangan havo" deb atashgan. - They called nitrogen "burnt or dephlogisticated air".

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6. Bu kislorodsiz havo degan ma'noni bildiradi. - It meant air without oxygen.
7. Azot gazi (H_2) yer yuzidagi havoning 78,1% tashkil qiladi. - Nitrogen gas (H_2) makes up 78,1% of the Earth's air.
8. Mars atmosferasida faqatgina 2,6% azot bor. - The atmosphere of Mars is only 2,6% nitrogen.
9. Fransuz ximigi A.L.Lavoyzer nitro- - French chemist A.L.Lavoisier named

genni azot deb atadi. nitrogen azote.

10. Nitrogen birikmalari oziq-ovqat-larda ham uchraydi. - Nitrogen compounds are found in foods.

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11. Nitrogen gaz sifatida rangsiz va hidsizdir. - Nitrogen as a gas is colorless and odorless.

12. Nitrogen gazi ammiak selitrasini suvdagi eritmasini (NH_4NO_3) qizdirish orqali olinadi. - Nitrogen gas can be prepared by heating a water solution of ammonium nitrate (NH_4NO_3).

13. Nitrogen gazi deyarli inert hisoblanadi. - Nitrogen gas is relatively inert.

14. Nitrogen ko'rinishidan suvga o'xshash. – Nitrogen is similar in appearance to water.

15. Jahondagi bir qancha quruq iqlim sharoitida bunday selitra ko'p uchraydi. - In certain dry areas of the world these saltpetre are found in quantity.

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16. Ular qishloq xo'jaligida o'g'it sifatida foydalaniladi. - They are used as fertilizers in agriculture.

17. Anorganik nitrogen tarkibiga (yoki qorishmalariga) nitrat kislota (HNO_3), ammiak (NH_3), oksidlar (NO, NO_2, N_2O_4, N_2O) kiradi. - Inorganic nitrogen compounds are nitric acid (HNO_3), ammonia (NH_3), oxides (NO, NO_2, N_2O_4, N_2O).

18. Ammiak (NH_3) nitrogenning eng muhim savdo komponenti hisoblanadi. - Ammonia (NH_3) is the most important commercial compound of nitrogen.

19. Bu rangsiz, o'tkir hidli gaz oson suyuqlikka aylanadi. - This colorless gas with a pungent odor is easily liquefied.

20. Bu suyuqlik nitrogen o'g'it sifatida ishlatiladi. - This liquid is used as a fertilizer.

TEXT FIVE: CARBON

Carbon- C (Latin: carbo, charcoal). Carbon, an element of prehistoric discovery, is very widely distributed in nature. Sixth most abundant element in the universe. It is found in abundance in the sun, stars, comets, and atmospheres of most planets. Carbon in the form of microscopic diamonds is found in some meteorites. Natural diamonds are found in kimberlitic of ancient volcanic "pipes," found in South Africa, Arkansas, and elsewhere. Diamonds are now also being recovered from the ocean floor off the Cape of Good Hope. Much of all industrial diamonds used in the world today are now made synthetically. The energy of the sun and stars can be attributed at least in part to the well-known carbon-nitrogen cycle. Carbon is found free in nature in three allotropic forms: amorphous, graphite, and diamond. A fourth form, known as "white" carbon, is now thought to exist. Ceraphite is one of the softest known materials while diamond is one of the hardest. Graphite exists in two forms: alpha and beta. These have identical physical properties, except for their crystal structure. Naturally occurring graphites are reported to contain as much as 30% of the rhombohedra (beta) form, whereas synthetic materials contain only the alpha form. The hexagonal alpha type can be converted to the beta by mechanical treatment, and the beta form reverts to the alpha on heating it above 1000^{o}C. In 1969 a new allotropic form of carbon was produced during the sublimation of pyrolytic graphite at low pressures. Under free-vaporization conditions above 2550 K, "white" carbon forms as small transparent crystals on the edges of the planes of graphite. The interplanar spacings of "white" carbon are identical to those of carbon form noted in the graphite gneiss from the Ries (meteroritic) Crater of Germany. "White" carbon is a transparent birefringent material. Little information is presently available about this allotrope. In combination, carbon is found as carbon dioxide in the atmosphere of the earth and dissolved in all natural waters. It is a component of great rock masses in the form of carbonates of calcium (limestone), magnesium, and iron. Coal, petroleum, and natural gas are chiefly hydrocarbons. Carbon is unique among the elements in the vast number and variety of compounds it can form. With hydrogen, oxygen, nitrogen, and other elements, it forms a very large number of compounds, carbon

atom often being linked to carbon atom. There are close to ten million known carbon compounds, many thousands of which are vital to organic and life processes. Without carbon, the basis for life would be impossible. While it has been thought that silicon might take the place of carbon in forming a host of similar compounds, it is now not possible to form stable compounds with very long chains of silicon atoms. The atmosphere of Mars contains 96.2% CO_2. Some of the most important compounds of carbon are carbon dioxide (CO_2), carbon monoxide (CO), carbon disulfide (CS_2), chloroform ($CHCl_3$), carbon tetrachloride (CCl_4), methane (CH_4), ethylene (C_2H_4), acetylene (C_2H_2), benzene (C_6H_6), acetic acid (CH_3COOH), and their derivatives. Carbon has seven isotopes. In 1961 the International Union of Pure and Applied Chemistry adopted the isotope carbon-12 as the basis for atomic weights. Carbon-14, an isotope with a half-life of 5715 years, has been widely used to date such materials as wood, archaeological specimens, etc.

G L O S S A R Y

1. carbon- углерод - uglerod

2. distributed – распределенные - tarqatish, taqsimlash

3. abundant element- распространенный элемент - keng tarqalgan element

4. abundance- изобилие - ko'p, to'lib-toshgan

5. amorphous – аморфно - amorf, mo'rt

6. hexagonal alpha – гексагональной альфа - geksogonal alfa

7. dissolved – растворенных - eritilgan

8. petroleum – нефтепродуктов - neft mahsulotlari

9. chiefly hydrocarbons – главным углеводороды - asosan uglevodorodlar

10. chains of silicon atoms – цепи из атомов кремния - kremniy atomidan tashkil topgan zanjirlar

11. derivatives – производные - yasama, boshqa elementdan hosil qilingan

12. International Union of Pure – Международный Союз Чистой - Halqaro Soflik Ittifoqi

13. Applied Chemistry – Прикладная Химия - Amaliy Kimyo

14. archaeological specimens - археологических образцов - arxeologik namunalar

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

1. How many abundant element in the Universe?
2. Where carbon was founded?
3. In what places natural diamonds were founded?
4. How many isotopes has carbon?
5. What happened in 1996 year?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Uglerod tabiatda keng tarqalgan.	– Carbon is very widely distributed in nature.
2. U yer yuzidagi oltita eng ko'p tarqalgan elementlardan biri.	- It is one of the most abundant six elements.
3. U quyosh, yulduzlar va kometalarda uchraydi.	- It is found in the sun, stars and comets.
4. Uglerod ko'pchilik planetalarning atmosferasida uchraydi.	- It is found in the atmosphere of most planets.
5. Uglerod tabiatda sof holda uchraydi	– Carbon is found free in nature.
	******
6. U tabiatda uch shaklda: nokristal, grafit va brilliant shaklda uchraydi.	- It is found in three forms in nature: amorphous, graphite, diamond.
7. Hozirda "oq" uglerodning borligi ham faraz qilinmoqda.	- Now "white" carbon is thought to exist.
8. Grafit ikki shaklda mavjud: al'fa va beta.	- Graphite exists in two forms: alpha and beta.
9. Ular o'xshash fizik xususiyatga ega.	– They have identical physical

properties.

10. 1969 yili uglerodning yangi allotropik shakli yaratildi. - In 1969 a new allotropic form of carbon was produced.

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11. Bu allotrop haqida juda oz ma'lumot mavjud. - Little information is available about this allotrope.

12. Uglerod atmosferada uglerod dvuokisi tarzida mavjud. - Carbon is found as carbon dioxide in the atmosphere.

13. Ko'mir, neft va tabiiy gaz asosan uglevodorod hisoblanadi. - Coal, petroleum and natural gas are chiefly hydrocarbons.

14. O'n millionga yaqin uglerod qo'shilmalari mavjud. - There are close to ten million carbon compounds there.

15. Uglerodsiz hayot asoslari bo'lishi mumkin emas. - Without carbon the basis for life would be impossible.

******

16. Mars atmosferasida 96,2% (CO_2) uglerod bor. - There is 96,2% (CO_2) in the atmosphere of Mars.

17. Uglerodning yettita izotopi mavjid. – Carbon has seven isotopes.

18. Uglerod -12 izotopi atom og'irligi uchun asos qilib olindi. - The isotope carbon -12 is adopted as the basis for atomic weights.

19. Sanoatda ishlatiladigan ko'plab olmoslar sun'iy yo'l bilan olinadi. - Much of industrial diamonds are made synthetically.

20. Tabiiy olmoslar janubiy Afrika, Ankanzas va boshqa joylarda uchraydi. - Natural diamonds are found in South Africa, Arkansas and other places.

TEXT SIX: SILICON

Silicon- Si (L. silex, silicis, flint) Davy in 1800 thought silica to be a compound and not an element; later in 1811, Gay Lussac and Thenard probably prepared impure amorphous silicon by heating potassium with silicon tetrafluoride. In 1824 Berzelius, generally credited with the discovery, prepared amorphous silicon by the same general method and purified the product by removing the fluosilicates by repeated washings. Deville in 1854 first prepared crystalline silicon, the second allotropic form of the element. Silicon is present in the sun and stars and is a principal component of a class of meteorites known as aerolites. It is also a component of tektites, a natural glass of uncertain origin. Silicon makes up 25.7% of the earth's crust, by weight, and is the second most abundant element, being exceeded only byoxygen. Silicon is not found free in nature, but occurs chiefly as the oxide and as silicates. Sand, quartz, rock crystal, amethyst, agate, flint, jasper, and opal are some of the forms in which the oxide appears. Granite, hornblende, asbestos, feldspar, clay, mica, etc. are but a few of the numerous silicate minerals. Silicon is prepared commercially by heating silica and carbon in an electric furnace, using carbon electrodes. Several other methods can be used for preparing the element. Amorphous silicon can be prepared as a brown powder, which can be easily melted or vaporized. The Czochralski process is commonly used to produce single crystals of silicon used for solid-state or semiconductor devices. Hyperpure silicon can be prepared by the thermal decomposition of ultra-pure trichlorosilane in a hydrogen atmosphere, and by a vacuum float zone process. Silicon is one of man's most useful elements. In the form of sand and clay it is used to make concrete and brick; it is a useful refractory material for high-temperature work, and in the form of silicates it is used in making enamels, pottery, etc. Silica, as sand, is a principal ingredient of glass, one of the most inexpensive of materials with excellent mechanical, optical, thermal, and electrical properties. Glass can be made in a very great variety of shapes, and is used as containers, window glass, insulators, and thousands of other uses. Silicon tetrachloride can be used as iridize glass. Hyperpure silicon can be doped with

boron, gallium, phosphorus, or arsenic to produce silicon for use in transistors, solar cells, rectifiers, and other solid-state devices which are used extensively in the electronics and space-age industries. Hydrogenated amorphous silicon has shown promise in producing economical cells for converting solar energy into electricity. Silicon is important to plant and animal life. Diatoms in both fresh and salt water extract Silica from the water to build their cell walls. Silica is present in the ashes of plants and in the human skeleton. Silicon is an important ingredient in steel; silicon carbide is one of the most important abrasives and has been used in lasers to produce coherent light of 4560 A. Silicones are important products of silicon. They may be prepared by hydrolyzing a silicon organic chloride, such as dimethyl silicon chloride. Hydrolysis and condensation of various substituted chlorosilanes can be used to produce a very great number of polymeric products, or silicones, ranging from liquids to hard, glasslike solids with many useful properties. Crystalline silicon has a metallic luster and grayish color. Silicon is a relatively inert element, but it is attacked by halogens and dilute alkali. Most acids, except hydrofluoric, do not affect it. Elemental silicon transmits more than 95% of all wavelengths of infrared, from 1.3 to 6.y micro-m. Miners, stonecutters, and others engaged in work where siliceous dust is breathed into large quantities often develop a serious lung disease known as silicosis.

G L O S S A R Y

1. *silicon – кремний - kremniy*
2. *impure amorphous silicon – нечистого аморфного кремния - toza (sof) bo'lmagan amorf kremniy*
3. *by heating potassium – отопление калия - kaliyni qizdirish orqali*
4. *silicon tetrafluoride – тетрафторид кремния - tetraftorid kremniy*
5. *purified – очищенная - tozalangan, distillangan*
6. *flu silicates by repeated washings – путем многократных стирок - ko'p marotali yuvish orqali*
7. *aerolites – аэролиты - aerolitlar*
8. *uncertain origin – неясного происхождения - kelib chiqishi*

9. *the earth's crust - земной коры - yer qobig'i*
10. *silicates – силикатов - silikatlar*
11. *amethyst – аметист - ametist*
12. *flint – кремневые - kremniyli*
13. *jasper – джаспер - yashma toshi (mineral)*
14. *opal – опал - opal (shishaga o'xshash mineral tosh)*
15. *hornblende - роговой обманки - shoxli obmanka (mineral tosh)*
16. *asbestos – асбеста - asbest, toshpaxta (tola-tola o'tga chidamli mineral)*
17. *feldspar – полевой шпат - dala shpati*
18. *clay – глины - loy*
19. *mica – слюды - slyuda (shaffof mineral)*
20. *electric furnace – электрические печи - elektr pechkasi*
21. *amorphous silicon – аморфный кремний - amorf (mo'rt) kremniy*
22. *brown powder – коричневый порошок - jigarrang kukun*
23. *trichlorosilane – трихлорсилана - trixlorosilan*
24. *refractory material – огнеупорных материалов - o'ta chidamli materiallar*
25. *enamels – эмали - emallar*
26. *pottery – керамика - keramika, kulonchilik*
27. *silica – кремний - kremniy*
28. *boron – бора - bor (kimyoviy element)*
29. *arsenic – мышьяк - margumush*
30. *grayish color – сероватого цвета - kulrangsimon rang*
31. *dilute alkali - разбавленных щелочей - eritilgan ishqor*
32. *stonecutters – каменотесами - toshtarashchilar, tosh yo'nuvchilar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is a Silicon?

Who and when was prepared silicon?

Where is silicon present?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Kremni ham kimyoviy elementlardan biri. - Silicon is also one of the chemical elements.

2. Deyvi Kvarsni element emas, balki birikma deb o'ylagan. - Davy thought silica to be a compound and not an element.

3. 1811 yil Gel Lussak va Tenard kaliyni tetraftorid kremniy bilan birga qizdirish orqali sof bo'lmagan amorf kremniyy olishga erishdi. - In 1811 Gay Lussae and Thenard could prepare impure amorphosilicon by heating potassium with silicon tetrafluoride.

4. Berzelius amorf kremniyni to'xtovsiz yuvish orqali florosilikatlardan tozaladi. - Berzelius purified amorphous Silicon by removing the flu silicates by repeated washings.

5. Devile 1854 yili birinchi bor kristal kremniyni olishga erishgan. - Deville in 1854 first could prepare crystalline silicon.

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6. Kremniy quyosh va yulduzlarda mavjud. – Silicon is present in the sun and in stars.

7. Kremniy Aerolit deb nomlangan metiorit tarkibida ham uchraydi. - Silicon is present in the metiorit which is called Aerolit

8. U tektidlar tarkibida ham bor. – It is also a component of tektites.

9. Kremniy yer qobg'ining 25,7% tashkil qiladi. - Silicon makes up 25,7% of the earth's crust.

10. Kremniy tabiatda sof holda uchramaydi. - Silicon is not found free in nature.

******

11. U asosan oksid va silikatlar tarkibida namoyon bo'ladi. - It chiefly occurs as oxide and silicates.

12. Tijorat maqsadidagi kremniy kvars va uglerodni elektr pechida uglerod elektro- litlaridan foydalanib qizdirish orqali olinadi.

- Silicon is prepared commercially by heating silica and carbon in electric furnace using carbon electrodes.

13. Amorfkremniy jigarrang poroshok tarzida tayyorlanadi.

- Amorphous Silicon can be prepared as a brown powder most useful elements.

15. Kremniy qum va loy shaklida beton va g'isht tayyorlashda ishlatiladi.

- Silicon in the form of sand and clay is used to make concrete and brick.

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16. Issiq sharoitda ishlaganda kremniy issiqqa chidamli ko'rinish materiali siatida foydalidir.

- It is a useful refractory material for high temperature work.

17. Kvars, qum tarzida shishaning eng muhum mahsuloti hisoblanadi.

- Silica, as sand, is a principal ingredient of glass.

18. Yuqori darajadagi toza kremniy tranzistorlar va boshqa qatttiq holatdagi priborlar ishlab chiqarishga ishlatiladi.

- Higher pure Silicon can be used in producing transistors and other solid state devices.

19. Kremniy o'simliklar va hayvonlar hayoti uchun zarur.

- Silicon is important to plant and animal life.

20. Kremniy o'simliklar kulida va in- son skeletida mavjud.

- Silicon is present in the ashes of plants and in the human skeleton.

TEXT SEVEN: SULFUR

Sulfur- S (Sanskrit, sulvere; L. sulpur). Known to the ancients; referred to in Genesis as brimstone. Sulfur is found in meteorites. R.W. Wood suggests that the dark area near the crater Aristarchus is a sulfur deposit. Sulfur occurs native in the vicinity of volcanos and hot springs. It is widely distributed in nature as iron pyrites, galena, sphalerite, cinnabar, stibnite, gypsum, epsom salts, celestite, barite, etc. Sulfur is commercially recovered from wells sunk into the salt domes along the Gulf Coast of the U.S. Using the Frasch process heated water is forced into the wells to melt the sulfur, which is then brought to the surface. Sulfur also occurs in

natural gas and petroleum crudes and must be removed from these products. Formerly this was done chemically, which wasted the sulfur; new processes now permit recovery. Large amounts of sulfur are being recovered from Alberta gas fields. Sulfur is pale yellow, odorless, brittle solid, which is insoluble in water but soluble in carbon disulfide. In every state, whether gas, liquid or solid, elemental sulfur occurs in more than one allotropic form or modification; these present a confusing multitude of forms whose relations are not yet fully understood. In 1975, University of Pennsylvania scientists reported synthesis of polymeric sulfur nitride, which has the properties of a metal, although it contains no metal atoms. The material has unusual optical and electrical properties. High-purity sulfur is commercially available in purities of 99.999%. Amorphous or "plastic" sulfur is obtained by fast cooling of the crystalline form. X-ray studies indicate that amorphous sulphur may have a helical structure with eight atoms per spiral. Crystalline sulfur seems to be made of rings, each containing eight sulfur atoms, which fit together to give a normal X-ray pattern. Eleven isotopes of sulfur exist. None of the four isotopes that in nature are radioactive. A finely divided form of sulfur, known as flowers of sulfur, is obtained by sublimation. Organic compounds containing sulfur are very important. Calcium sulfur, ammonium sulfate, carbon disulfide, sulfur dioxide, and hydrogen sulfide are but a few of the many important compounds of sulfur. Sulfur is a component of black gunpowder, and is used in the vulcanization of natural rubber and a fungicide. It is also used extensively in making phosphatic fertilizers. A tremendous tonnage is used to produce sulfuric acid, the most important manufactured chemical. It is used to make sulfite paper and other papers, to fumigate fumigant, and to bleach dried fruits. The element is a good insulator. Sulfur is essential to life. It is a minor constituent of fats, body fluids, and skeletal minerals. Carbon disulfide, hydrogen sulfide, and sulfur dioxide should be handled carefully. Hydrogen sulfide in small concentrations can be metabolized, but in higher concentrations it quickly can cause death by respiratory paralysis. It quickly deadens the sense of smell. Sulfur dioxide is a dangerous component in atmospheric air pollution.

G L O S S A R Y

1. *sulfur – сера* - *oltingugurt*

3. vicinity of volcanos – близости от вулкана - *vulqon yaqinida*

4. pyrites – пирит - *pirit (mineral)*

5. galena – галена - *galenit (mineral)*

6. sphalerite – сфалерита - *sfalerit*

7. cinnabar – киновари - *kinovar (qizil rangli mineral)*

9. gypsum – гипс - *gips*

10. epsom salts – английской соли - *ingliz tuzi*

11. celestite – целестин - *tselestin (mineral)*

12. barite – барит - *barit (mineral)*

13. surface – поверхности - *yuza, sath*

14. petroleum crudes – нефтяного сырья - *neft xomashyosi*

15. odourless – без запаха - *hidsiz*

16. brittle solid – хрупких твердых - *mo'rt, qattiq*

17. insoluble – нерастворимых - *erimaydigan*

19. amorphous sulphur – аморфных серы - *amorf oltingugurt*

21. black gunpowder – черного пороха - *qora porox*

22. a fungicide – фунгицид - *fungisid*

23. phosphatic fertilizers - *фосфатные удобрения* - *fosfatli o'g'itlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is sulfur? How is presented sulfur? Is sulfur essential to life?

qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Otingugurt qadimdan ma'lum.	– Sulfur is known from ancient times.
2. Oltingugurt meteoritlarda uchraydi	- Sulfur is found in meteorites.
3. Oltingugurt vulqonlarga yaqin joy-larda va chashmalarda uchraydi.	- Sulfur occurs nature in the vicinity of volcanos and hot springs.

4. U tabiatda temir piriti, galena, sfalerit, kinobar, gips, ingliz tuzi, selestin tarkibida ko'p uchraydi.

It is widely distributed in nature as iron pyrites, galona, sphalerite, cinna bar, gypsium, epson salts, celestite.

5. Oltingugurt tabiiy gaz va hom neftda ham uchhraydi.

- Sulfur also occurs in natural gas and petrolium crudes.

*****

6. Oltingururt ushbu mahsulotlardan ajratib olinadi.

- Sulfur is removed from these products.

7. Ko'p miqdordagi oltingugurt Alberta gaz konlaridan olinadi.

- Large amounts of sulfur are being recovered from Alberta gas fields.

8. Oltingugrt oq sariq, hidsiz, mo'rt kukun bo'lib, suvda erimaydi, lekin sulfat vodorod eritmasida eriydi.

– Sulfur is pale yellow, odorless, brittle solid, which is in soluble in water but soluble in carbon disulfide.

9. Polimerik sulfat nitratida metal xususiyatlari bor.

- Polymeric sulfur nitride has the properties of a nitrade.

10. Ammo uning tarkibida metal atomlari yo'q.

- But it contains no metal atoms.

*****

11. Oltingugurtning bir necha turi mavjud.

- There are several types of sulfur.

12. Ular sof holdagi oltingugurt, amorfli oltingugurt, kristal oltingugurt va boshqalar.

- They are high purity sulfur, amorphous sulfur, cristalline sulfur and others.

13. Amorf oltingugurti "plastik" oltingugurt deb ham ataladi.

- Amorphous sulfur is also called "plastic" sulfur.

14. "Plastik" oltingugurt kristal shakldagi oltingugurtni tez sovutish orqali olinadi.

- "Plastic" sulfur is obtained by fast cooling of the crystalline form.

15. Kristal oltingugurt doirachalardan tashkil topganga o'xshaydi.

- Crystalline sulfur seems to be made of rings.

*****

16. Oltingugurtni 11 ta izotopi mavjud.

- Eleven isotops of sulfur exist.

17. Oltingugurt qora porxning tarkibiga kiradi. - Sulfur is a component of black gun powder.

18. Oltingugurt fosforli o'gitlar tayyorlashda ham keng ishlatiladi. - Sulfur is used extensively in making phosphatic fertilizers.

19. Ko'plab tonna oltingugurt oltingugurt kislotaci ishlab chiqarish uchun ishlatiladi. - A tremendous tonnage of sulfur is used to produce sulfaric acid.

20. Oltingugurt dioksid atmosferani ifloslantiruvchi havfli komponentdir. - Sulfur dioxide is a dangerous component in atmospheric air pollution.

TEXT EIGHT: SELENIUM

Selenium- Se (Gr. Selene, moon) Discovered by Berzelius in 1817, who found it associated with tellurium, named for the earth. Selenium is found in a few rare minerals such as crooksite and clausthalite. In years past it has been obtained from flue dusts remaining from processing copper sulfide ores, but the anode metal from electrolytic copper refineries now provide the source of most of the world's selenium. Selenium is recovered by roasting the muds with soda or sulfuric acid, or by smelting them with soda and niter. Selenium exists in several allotropic forms. Three are generally recognized, but as many as that have been claimed. Selenium can be prepared with either an amorphous or crystalline structure. The color of amorphous selenium is either red, in powder form, or black, in vitreous form. Crystalline monoclinic slenium is a deep red; crystalline hexagonal selenium, the most stable variety, is a metallic gray. Selenium exhibits both photovoltaic action, where light is converted directly into electricity, and photoconductive action, where the electrical resistance decreases with increased illumination. These properties make selenium useful in the production of photocells and exposure meters for photographic use, as well as solar cells. Selenium is also able to convert a.c. electricity to d.c., and is extensively used in rectifiers. Below its melting point selenium is a p-type semiconductor and is finding many uses in electronic and solid-state applications. Elemental selenium has been said to be practically nontoxic and is considered to be an essential trace element; however, hydrogen

selenide and other selenium compounds are extremely toxic, and resemble arsenic in their physiological reactions. Naturally selenium contains six stable isotopes. Fifteen other isotopes have been characterized. The element is a member of the sulfur family and resembles sulfur both in its various forms and in its compounds. Selenium is used in document reproducing and copying. It is used by the glass industry to decolorize glass and to make ruby-colored glasses and enamels. It is also used as a photographic toner, and as an additive to stainless steel. Hydrogen selenide in a concentration of 1.5 ppm is intolerable to man. Selenium occurs in some solid in amounts sufficient to produce serious effects on animals feeding on plants, such as locoweed, grown in such soils. Exposure to selenium compounds (as Se) in air should not exceed 0.2 mg/m3 (8-hour time-weighted average - 40-hour week).

G L O S S A R Y

1. *selenium – селен - selen*
2. *tellurium – теллур - tellur*
3. *copper sulfide ores – медных сульфидных руд - mis sulfidli ruda*
4. *niter – селитры - selitra*
5. *an amorphous or crystalline structure – аморфной и кристаллической структуры - amorf va kristal tizimli (shaklli)*
6. *vitreous form – стекловидного форме - shishasimon shaklda*
7. *monoclinic selenium – моноклинный селен - bir turli selen*
8. *crystalline hexagonal selenium – гексагональный кристаллический селен - geksagonal kristalli selen*
9. *resemble arsenic - напоминают мышьяк - margumushni eslatuvchi (margumushga o'xshash)*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is Selenium? How is selenium present? How many stables does selenium contain?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Selen 1817 yil Bertselius tomonidan kashf qilingan. - Selenium was discovered by Berzeulis in 1817.
2. Selen juda kam uchraydigan kimyoviy elementlardan biri. - Selenium is one of the rarely found chemical elements.
3. Yillar davomida u mo'ri changlaridan olinib kelingan. - In years it has been obtained from flue dusts.
4. Selen bir necha allotropik shakllarda uchraydi. - Selenium exists in several allotropic forms.
5. Selen chiqindilarini soda yoki sulfat kislotasi bilan qo'shib qizdirish (yondirish) orqali olinadi. - Selenium is recovered by roasting the muds with soda or sulfuric acid.

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6. Selen amorf yoki kristal shaklda tayyorlanishi mumkin. - Selenium can be prepared with either an amorphones or crystalline structure.
7. Amorf selenning ranggi kukun shaklida qizil yoki shishasimon qora bo'ladi. - The colour of amorphous selenius is either red, in powder form or black in viterous form.
8. Kristalsimon monoklinik selen to'q qizil rangga ega. - Crystalline monoclinic selenium is deep red.
9. Uning eng barqaror (o'zgarmas) turi kulrang metal rangida bo'ladi. - It's the most stable variety is a metallic grey.
10. Selen fotografiyada keng ishlatiladi. – Selenium is widely used in photography.

*****

11. U fotoelementlar ishlab chiqishda juda foydali. - It is very useful in the production of photocells.
12. Boshlang'ich ko'rinishdagi selen amalda zaharli emas. - Elemental selenium is practically non-toxic.

13. Odatda(tabiiy holda) selen oltita barqaror izotopdan tashkil topgan. - Naturally selenium contains six stable isotops.

14. Bu element sulfatlar oilasiga mansub. - This element is a member of the sulfur family.

15. Selen hujjat ishlarida va nusxa ko'chirishda ishlatiladi. - Selenium is used in document reproducing and copying.

*****

16. Selen shishasozlik sanoatida shishani rangsizlantirish uchun ishlatiladi. - In glass industry it is used to decolorize glass.

17. U yorqin qizil rangli shishalar ishlab chiqishda va emallashda ham ishlatiladi. - It is also used in producing rubycoloured glasses and enamles.

18. Selen fotografik toner sifatida ham ishlatiladi. - Selenium is also used as a photographic toner.

19. Biz selenning ko'p kimyoviy xususiyatlarini o'rganib oldik. - We have learned many characteristic chemical features of selenium.

LESSON NINE.

TEXT: TELLURIUM

Tellurium- Te (L. tellus, earth) Discovered by Muller von Reichenstein in 1782; named by Klaproth, who isolated it in 1798. Tellurium is occasionally found native, but is more often found as the telluride of gold (calaverite), and combined with other metals. It is recovered commercially from the anode muds that are produced during the electrolytic refining of blister copper. Canada, Peru, Japan and the U.S. are the largest Free World producers of the element. Crystalline tellurium has a silvery-white appearance, and when pure exhibits a metallic luster. It is brittle and easily pulverized. Amorphous tellurium is found by precipitating tellurium from a solution of telluric or tellurous acid. Whether this form is truly amorphous, or made of minute crystals, is open to question. Tellurium is a p-type semiconductor, and shows greater conductivity in certain directions, depending on alignment of the atoms. Its conductivity increases slightly with exposure to light. It

can be doped with silver, copper, gold, tin, or other elements. In air, tellurium burns with a greenish-blue flames, forming the dioxide. Molten tellurium corrodes iron, copper, and stainless steel. Tellurium and its compounds are probably toxic and should be handled with care. Workmen exposed to as little as 0.01 mg/m3 of air, or less, develop "tellurium breath," which has a garlic-like odor. Thirty isotopes of tellurium are known, with atomic masses ranging from 108 to 137. Natural tellurium consists of eight isotopes. Tellurium improves the machinability of copper and stainless steel, and its addition to lead decreases the corrosive action of sulfuric acid on lead and improves its strength and hardness. Tellurium is used as a basic ingredient in blasting caps, and is added to cast iron for chill control. Tellurium is used in ceramics. Bismuth telluride has been used in thermoelectric devices.

G L O S S A R Y

1. *tellurium – теллур - tellur*
2. *the telluride of gold – теллурид золота - tellurid oltin*
3. *blister copper – черной меди - qora mis*
4. *metallic luster – металлический блеск - metalrang (metalsimon) yog'du*
5. *amorphous tellurium – аморфный теллур - amorf tellur*
6. *exposure – экспозиции - ekspozitsiya*
7. *copper – медь - mis*
8. *a greenish-blue flames – зеленовато-голубое пламя - yashilhavorang olov*
9. *molten tellurium – расплавленный теллур - eritilgan tellur*
10. *stainless steel - из нержавеющей стали - zanglamaydigan po'latdan*
11. *a garlic-like odor – чесночный запах - sarimsoqqa o'xshash hid*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is tellurium? When did tellurium discover and by whom?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yoki yozib) bering)

4. Seans o'zbekcha - inglizcha 20 ta

1. Tellur kimyoviy elementdir. - Tellurium is a chemical element.

2. Tellur Myuller fon Reyxenshteyn tomonidan 1782 yil kashf qilingan. - Tellurium was discovered by Muller von Reichenstein in 1782.

3. Tellur ba'zan tabiiy holda uchraydi. - Tellurium is occasionally found nature.

4. Bu element Kanada, Peru, Yaponiya va AQSHda ko'plab topiladi. - This element is found in Canada, Peru, Japan and the USA.

5. Ular ushbu elementni jahon miqyosida ishlab chiqaruvchilar hisoblanadi. - They are the world producers of this element.

*****

6. Kristal tellur oq kumushrang ko'rinishga ega. - Craystalline tellurium has a silvery white appearance.

7. U mo'rt bo'lib osongina kukunga aylanadi. - It is britle and easily pulverized.

8. Tellur p-turdagi ayrim o'tkazgich hisoblanadi. - Tellerium is a p-type semiconductor.

9. Yorug'lik ostida uning o'tkazuvchanligi ortib boradi. - It's conductivity increases slightly with exposure to light.

10. U kumush, mis, oltin, qo'rg'oshin va boshqa elementlar bilan qoplanishi mumkin. - It can be doped with silver, copper, gold, tin or other elements.

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11. Havoda tellur yashilrang ko'k tusda alangalanib yonadi. - In air tellurium burns with a greenish-blue flands.

12. Eritilgan tellur temirni, misni va zanglamaydigan po'latni yemirib tashlaydi (karroziyaga uchratadi). - Melten tellurium corrodes iron, copper and stainless steel.

13. Tellur va tellurli birikmalar zaharli. - Tellurium and its components are toxic.

14. Tellur bilan ehtiyotkor munosabatda - Tellurium should be handled with care.

bo’lish kerak.

15. Tellurning sarimsoq piyozga o’x-shash hidi bor. – Tellurium has a garlic like odor.

*****

16. Tellurning o’ttizta izotopi ma’lum. – Thirty isotops of tellurium are known.

17. Tabiiy tellur sakkizta izotopdan tashkil topgan. - Natural tellurium consists of eight isotops.

18. Tellurning yadroviy massasi 108 tadan 137 gacha. - The atomic mass of tellurium is from 108 to 137.

19. Tellur keramikada ishlatiladi. – Tellurium is used in ceramics.

20. Tellurid Bismut termoelektrik qurilmalarda ishlatilgan. - Bismuth telluride has been used in thermoelectric devices.

TEXT TEN: PHOSPHORUS

Phosphorus- P (Gr. phosphoros, light bearing; ancient name for the planet Venus when appearing before sunrise) Brand discovered phosphorus in 1669 by preparing it from urine. Phosphorus exists in four or more allotropic forms: white (or yellow), red, and black (or violet). Ordinary phosphorus is a waxy white solid; when pure it is colorless and transparent. White phosphorus has two modifications: alpha and beta with a transition temperature at -3.8^{o}C. It is insoluble in water, but soluble in carbon disulfide. It takes fire spontaneously in air, burning to the pentoxide. Never found free in nature, it is widely distributed in combination with minerals. Phosphate rock, which contains the mineral apatite, an impure tri-calcium phosphate, is an important source of the element. Large deposits are found in Russia, in Morocco, and in Florida, Tennessee, Utah, Idaho, and elsewhere. It is very poisonous, 50 mg constituting an approximate fatal dose. Exposure to white phosphorus should not exceed 0.1 mg/m3 (8-hour time-weighted average - 40-hour work week). White phosphorus should be kept under water, as it is dangerously reactive in air, and it should be handled with forceps, as contact with the skin may cause severe burns. When exposed to sunlight or when heated in its own vapor to

250^{o}C, it is converted to the red variety, which does not phosphoresce in air as does the white variety. This form does not ignitespontaneously and is not as dangerous as white phosphorus. It should, however, be handled with care as it does convert to the white form at some temperatures and it emits highly toxic fumes of the oxides of phosphorus when heated. The red modification is fairly stable, sublimes with a vapor pressure of 1 atm at 17 ^{o}C, and is used in the manufacture of safety matches, pyrotechnics, pesticides, incendiary shells, smoke bombs, tracer bullets, etc. White phosphorus may be made by several methods. By one process, tri-calcium phosphate, the essential ingredient of phosphate rock, is heated in the presence of carbon and silica in an electric furnace or fuel-fired furnace. Elementary phosphorus is liberated as vapor and may be collected under phosphoric acid, an important compound in making super-phosphate fertilizers. In recent years, concentrated phosphoric acids, which may contain as much as 70% to 75% P_2O_5 content, have become of great importance to agriculture and farm production. World-wide demand for fertilizers has caused record phosphate production. Phosphates are used in the production of special glasses, such as those used for sodium lamps. Bone-ash, calcium phosphate, is used to create fine chinaware and to produce mono-calcium phosphate, used in baking powder. Phosphorus is also important in the production of steels, phosphor bronze, and many other products. Trisodium phosphate is important as a cleaning agent, as a water softener, and for preventing boiler scale and corrosion of pipes and boiler tubes. Phosphorus is also an essential ingredient of all cell protoplasm, nervous tissue, and bones.

G L O S S A R Y

1. *phosphorus – фосфор - fosfor*
2. *allotropic forms – аллотропические формы - allotropic shakllar*
3. *fire spontaneously –спонтанный огонь - birdan (to'satdan) olovlanish*
4. *poisonous – ядовито - zaharli*
5. *forceps – щипцы - qisqichlar*
6. *own vapour – собственных паров - o'zining bug'iga*

7. *toxic fumes – токсичных паров - toksik (zaharli) bug'lar*
8. *vapor pressure – давление паров - bug' bosimi*
9. *silica – кремний - kremniy (mineral)*
10. *fuel-fired furnace – топливе печи - yoqilg'i pechkasi*
11. *sodium lamps – натриевые лампы - natriy chiroqlari*
12. *bone-ash – кости, пепел - suyak kuli*
13. *trisodium phosphate – тринатрийфосфат - trinatriyfosfat*
14. *nervous tissue - нервной ткани - asab to'qimasi (hujayrasi)*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is phosphorus? Where should white phosphorus be kept? By what methods may white phosphorus be made?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Fosfor Venera sayyorasining qadimgi nomi.	- Phosphorus is the ancient name of the planet Venus.
2. Brand fosforni 1669 yili kashf qilgan	- Brand discovered phosphorus in 1669.
3. Fosfor to'rt yoki ko'proq allotropik shaklda uchrashi mumkin.	- Phosphorus exists in four or more allotropic forms.
4. Ular oq (yoki sariq), qizil va qora (yoki siyohrang) bo'lishi mumkin.	- They may be white (or yellow), red and black (or violet).
5. Odatdagi fosfor ipsimon oq mod-dadir.	- Ordinary phosphorus is a waxy white solid.

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6. Oq fosforning ikkita modifikatsiyasi mavjud.	- White phosphorus has two modi-fications.
7. U suvda erimaydi, lekin uglerod disulfidda eriydi.	- It is insoluble in water but soluble in carbon disulfide.

8. U havoda tezda alangalanib ketadi. – It takes fire spontaneously in air.

9. Tabiatda u sof holda uchramaydi. – It is never found free in nature.

10. U minerallar bilan birikkan holda keng tarqalgan. - It is widely distributed in combination with minerals.

*****

11. Fosfat tog' jinslari ushbu element-ning muhim manbalari hisoblanadi. - Phosphate rock is an important sourse of the element.

12. Rossiya va Marokkoda fosforning katta konlari mavjud. - Large deposits of phosphorus are in Russia and Morocco.

13. AQSHning Florida, Tennesse, Utax, Aydaxo shtatlarida ham ko'plab topiladi. - It has large deposits in Florida, Tennessee, Utax, Idaho states of the USA.

14. Fosfor juda ham zaharli. – Phosphorus is very poisonous.

15. Oq fosfor suv ostida saqlanishi lozim. - White phosphorus should be kept under the water.

*****

16. Oq fosforni havoda reaksiyaga kirishib ketish xavfi katta. - White phosphorus is dangerously reactive in air.

17. Uni pinist bilan ushlash lozim. – It should be handled with forceps.

18. Fosfor teriga tegsa qattiq kuydirishi mumkin. - Phosphorus contact with the skin may cause severe burns.

19. Fosfor havfsiz gugurt, pirotexnika pestisitlar, yorqin iz qoldiruvchi o'qlar ishlab chiqarishda ishlatiladi. - Phosphorus is used in the manufacture of safety matches, pyrotechnics, pesticides, tracer bullets.

20. Trinatriy fosfat muhim tozalovchi modda hisoblanadi. - Trisodium phosphat is important as a cleaning agent.

TEXT ELEVEN: ARSENIC

Arsenic- As (L. arsenicum, Gr. arsenikon, yellow orpiment, identified with arenikos, male, from the belief that metals were different sexes; Arabic, Az-zernikh, the orpiment from Persian zerni-zar, gold) Elemental arsenic occurs in two

solid modifications: yellow, and gray or metallic, with specific gravities of 1.97, and 5.73, respectively. It is believed that Albertus Magnus obtained the element in 1250 A.D. In 1649 Schroeder published two methods of preparing the element. Mispickel, arsenopyrite, (FeSAs) is the most common mineral from which, on heating, the arsenic sublimes leaving ferrous sulfide. The element is a steel gray, very brittle, crystalline, semimetallic solid; it tarnishes in air, and when heated is rapidly oxidized to arsenous oxide with the odor of garlic. Arsenic and its compounds are poisonous. Arsenic is used in bronzing, pyrotechny, and for hardening and improving the sphericity of shot. The most important compounds are white arsenic, the sulfide, Paris green, calcium arsenate, and lead arsenate; the last three have been used as agricultural insecticides and poisons. Marsh's test makes use of the formation and ready decomposition of arsine. Arsenic is finding increasing uses as a doping agent in solid-state devices such as transistors. Gallium arsenide is used as a laser material to convert electricity directly into coherent light.

G L O S S A R Y

1. *arsenic – мышьяк - margumush*
2. *yellow orpiment – желтый аурипигмент - sariq auripigment*
3. *arsenopyrite – арсенопирит - arsenopirit*
4. *tarnishes in air – тускнеет в воздухе - havoda xiralashadi*
5. *arsenous – мышьяковистый - margumushli*
6. *coherent light - когерентного света - kogerent rangli*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is arsenic? What kind of arsenic do you know? How does arsenic present? Is it poisonous element?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Mishyak kimyoviy element bo'lib As belgiga ega.
- Arsenic is a chemical element and has the sign As.

2. Mishyak lotin tilida "arsenicum" bo'ladi.
- Arsenic is called "arsenicum" in Latin.

3. Mishyak o'zbek tilida "margumush" deyiladi.
- In Uzbek arsenic is called "margumish".

4. Margumush sariq rangdagi auripigmentdir.
- Arsenic is yellow orpiment.

5. Odatda u ikki ko'rinishda uchraydi: sariq va kulrang yoki metall tusda.
- Elemental arsenic occurs in two modifications: yellow and grey or metallic.

*****

6. Aytishlaricha, Al'bertus Magnus bu moddani eramizdan oldin 1250 yil olgan.
- It is believed that Albertus Magnus obtained this element in 1250 AD.

7. 1649 yil Shreder bu moddani tayyorlashning ikki xil usulini e'lon qilgan.
- In 1649 Schereder published two methods of preparing the element.

8. Mispikel yoki arsenopirit eng umumiy mineral.
- Mispickel or arsenoprite is the most common mineral.

9. Bu mineral qizdirilganda margumush undagi temirsimon sul'fatdan ajratib olinadi.
- On heating this mineral the arsenic sublimes leaving ferrous sulfide.

10. Bu element po'latsimon kulrang, mo'rt, kristallsimon yarimmetall modda.
- This element is a steel grey, very brittle, crystalline, semimetallic solid.

*****

11. Margumush havoda rangini yo'qotadi.
- Arsenic tarnishes in air.

12. Qizdirilganda tezda oksidlanib margumush oksidiga aylanadi.
- When heated it is rapidly oxidized to arsenous oxide.

13. Margumush oksidining sarimsoq piyozga o'xshash hidi bor.
- Arsenous oxide has the odor of garlic.

14. Margumush va uning komponentlari zaharli. - Arsenic and its components are poisonous.

15. Margumush bronzalashda va pirotex-nikada ishlatiladi. - Arsenic is used in bronzing and pyrotechny.

*****

16. Qo'rg'oshinsimon arsenid, kal'tsiy arsenid, parij yashilli margumushning eng muhim birikmalari hisoblanadi. - White arsenic, calcium arsenate, Paris green are the most important compounds of arsenic.

17. Ular qishloq xo'jaligida hasharotlarga qarshi vosita va zahar sifatida ishlatiladi. - They have been used as agricultural insecticides and poisonous.

18. Ular tranzistorlar kabi uskunalar ustini qoplovchi vosita sifatida ham keng ishla-tilmoqda. - They have also been using as a doping agent in solid state-devices such as transistors.

19. Galiyli arsenid lazer materiali sifatida ishlatiladi. - Gallium arsenide is used as a laser material.

20. Biz kimyoviy element margumush xu-susida ko'p narsa bilamiz. - We know much about the chemical element arsenic.

TEXT TWELLIVE: FLUORINE

Fluorine- F_2 (L. and F. fluere, flow or flux). In 1529, Georigius Agricola described the use of fluorspar as a flux, and as early as 1670 Schwandhard found that glass was etched when exposed to fluorspar treated with acid. Scheele and many later investigators, including Davy, Gay-Lussac, Lavoisier, and Thenard, experimented with hydrofluoric acid, some experiments ending in tragedy. The element was finally isolated in 1866 by Moissan after nearly 74 years of continuous effort. Fluorine is the most electronegative and reactive of all elements. It is a pale yellow, corrosive gas, which reacts with most organic and inorganic substances. Finely divided metals, glass, ceramics, carbon, and even water burn in fluorine with a bright flame. Until World War II, there was no commercial production of elemental fluorine. The nuclear bomb project and nuclear energy

applications, however, made it necessary to produce large quantities. Fluorine and its compounds are used in producing uranium (from the hexafluoride) and more than 100 commercial fluorochemicals, including many well known high-temperature plastics. Hydrofluoric acid etches the glass of light bulbs, etc. Fluorochloro-hydrocarbons are extensively used in air conditioning and refrigeration. The presence of fluorine as a soluble fluoride in drinking water to the extent of 2 pm may cause mottled enamel in teeth, when used by children acquiring permanent teeth; in smaller amounts, however, fluorides are added to water supplies to prevent dental cavities. Elemental fluorine has been studied as a rocket propellant as it has an exceptionally high specific impulse value. One hypothesis says that fluorine can be substituted for hydrogen wherever it occurs in organic compounds, which could lead to an astronomical number of new fluorine compounds. Compounds of fluorine with rare gases have now been confirmed in fluorides of xenon, radon, and krypton. Elemental fluorine and the fluoride ion are highly toxic. The free element has a characteristic pungent odor, detectable in concentrations as low as 20 ppb, which is below the safe working level. The recommended maximum allowable concentration for a daily 8-hour time-weighted exposure is 1 ppm. Safe handling techniques enable the transport liquid fluorine by the ton.

G L O S S A R Y

1. *fluorine – фтор - ftor*
2. *hydrofluoric acid – плавиковой кислоты - ftorovodorod kislotasi*
3. *corrosive gas – агрессивных газов - tajovuzkor gazlar*
4. *radon – радон - radon*
5. *krypton – криптон - kripton*
6. *pungent odor – острый запах - o'tkir hid*
7. *safe handling techniques – безопасные приемы обработки - ishlashning xavfsiz usullari*
8. *liquid fluorine - жидкий фтор - suyuq ftor*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is fluorine? What do you know about fluorine? What is elementar fluorine?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Ftorning belgisi F2. – The sign of fluorine is F2.

2. Ftorni eritma yoki flyus ham deb atashadi. - Fluorine is also called as flow or fluz.

3. 1529 yil Georgius Arigola eritma shpatni ishlatilishni flyus deb tasvirlagan edi. - In 1529, Georigius Arigola described the use of fluospar as a fluz.

4. Kislotali eritma shpat ta'sirida shishaga o'yib yozish mumkin. - The glass can be etched when exposed to fluorspar treated with acid.

5. Buni ilk bor 1670 yil Shvandxard topgan edi. – In 1670 Schwandhard first found it.

*****

6. Sheele va boshqa tadqiqotchilar Deyvi, Gey-Lussak, Lavozier va Tenardlar vodorod ftorid bilan tajriba olib borishgan. - Scheele and other investigators Davy, Gay-Lussac, Lavoisier and Thenard experimented with hydrofluoric acid.

7. Ushbu tajribalarning ba'zilari halokatli yakun topgan. - Some of these experiments ended in tragedy.

8. 74 yillik urunishdan keyin, nihoyat 1866 yil Moyssan tomonidan ftor ajratib olindi. - Finally, after 74 years of effort in 1866 fluorine was isolated by Moissan.

9. Ftor barcha elementlarga qaraganda yuqori electromanfiylikka ega va faol element. - Fluorine is the most electronegative and reactive of all elements.

10. Shisha, keramika hatto suv ham ftorda yorqin alanga berib yonadi.

- Glass, ceramics even water burn in fluorine with bright flame.

*****

11. Ikkinchi jahon urushigacha ftor kommersiya maqsadida ishlab chiqilmagan.

- Untill World War II fluorine was not produced for commercial purposes.

12. Yadro bomba loyihasi ftorni ko'plab ishlab chiqilishiga zarurat tug'dirdi.

- The nuclear bomb project made it necessary the commercial production of elemental fluorine.

13. Ftor va uning komponentlari uran ishlab chiqarishda ishlatiladi.

- Fluorine and its components are used in production of uranium.

14. U yuzlab kommersiya maqsadidagi ftorli himikatlar ishlab chiqishda ham ishlatiladi.

- It is used in producing more than hundred commercial fluorichemicals.

15. Vodorod ftorid kislotadan yorqin shisha lampochkalar ishlab chiqarishda foydalaniladi.

- Hydrofluoric acid is used in producing the glass of light bulbs.

*****

16. Ftoroxlorid– uglevodorod havoni sovutishda va sovutgich(xolodilnik) larda keng qo'llaniladi.

- Flurochloro-hydrocarbons are extensively used in air conditioning and refregeration.

17. Gipotezalarga qaraganda ftor vodorodning o'rnini bosishi mumkin ekan.

- According to hypothesis fluorine can substitued for hydrogen.

18. Elementlar (boshlang'ich bosqichdagi) ftor va ftorli ion yuqori darajada zaharli.

- Elemental ion and fluoride ion are highly toxic.

19. Sof holdagi ftor o'ziga xos o'tkir hidga ega.

- The free element has characteristic pangent odor.

20. Tashishning havfsizlik texnikalari suyuq ftorni tonnalab tashish

- Safe handling techniques enable the transportation of liquid fluorine by the

imkonini beradi. ton.

TEXT THIRTEEN: CHLORINE

Chlorine- Cl_2 (Gr. Chloros, greenish yellow). Discovered in 1774 by Scheele, who thought it contained oxygen. Chlorine was named in 1810 by Davy, who insisted it was an element. In nature it is found in the combined state only, chiefly with sodium as common salt (NaCl), carnallite, and sylvite. It is a member of the halogen (salt-forming) group of elements and is obtained from chlorides by the action of oxidizing agents and more often by electrolysis; it is a greenish-yellow gas, combining directly with nearly all elements. At 10^{o}C one volume of water dissolves 3.10 volumes of chlorine, at 30 ^{o}C only 1.77 volumes. Chlorine is widely used in making many everyday products. It is used for producing safe drinking water the world over. Even the smallest water supplies are now usually chlorinated. It is also extensively used in the production of paper products, dyestuffs, textiles, petroleum products, medicines, antiseptics, insecticides, food, solvents, paints, plastics, and many other consumer products. Most of the chlorine produced is used in the manufacture of chlorinated compounds for sanitation, pulp bleaching, disinfectants, and textile processing. Further use is in the manufacture of chlorates, chloroform, carbon tetrachloride, and in the extraction of bromine. Organic chemistry demands much from chlorine, both as an oxidizing agent and in substitution, since it often brings many desired properties in an organic compound when substituted for hydrogen, as in one form of synthetic rubber. Chlorine is a respiratory irritant. The gas irritates the mucus membranes and the liquid burns the skin. As little as 3.5 ppm can be detected as an odor, and 1000 ppm is likely to be fatal after a few deep breaths. In fact, chlorine was used as a war gas in 1915. Exposure to chlorine should not exceed 0.5 ppm (8-hour time-weighted average – 40 hour week.)

G L O S S A R Y

1. *chlorine- хлор - xlor*
2. *sodium – натрий - natriy*

3. *carnallite – карналлит - karnallit*
4. *sylvite – сильвина - silvina*
5. *oxidizing agents – окисляющие вещества - oksidlovchi moddalar*
6. *dyestuffs – красители - bo'yoqlar*
7. *insecticides – инсектициды - hasharotlarga qarshi moddalar*
8. *solvents – растворителей - erituvchilar*
9. *pulp bleaching – отбеливания целлюлозы - tsellurozani oqartirish*
10. *the extraction of bromine – извлечение брома - bromni ajratib olish*
11. *respiratory irritant – дыхательных путей раздражающими веществами - nafas yo'llarini yallig'lantiruvchi moddalar*
12. *exposure to chlorine - воздействия хлора - xlorning ta'siri*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

What is chlorine? Where is it found? Where and how is the most chlorine produced used?

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Xlorning rangli belgisi Cl_2. – The sign of chlorine is Cl_2.
2. U yashil-sariq rangli gaz. – It is greenish yellow colour gas.
3. Xlor 1774 yil Sheele tomonidan kashf qilingan. - Chlorine was discovered by Scheele in 1774.
4. 1810 yil Deyvi uni xlor deb atadi. - In 1810 Davy named it chlorine.
5. U xlorni kimyoviy element sifatida tan olishni talab qiladi. - He insisted that chlorine is a chemical element.

*****

6. Tabiatda u birikma holda uchraydi. – In nature it is found in the combined state.

7. U galogen elementlar guruhiga mansub.
- It belongs to the halogen group (salt forming group) of elements.

8. U xlorli birikmalardan oksidlovchi moddalar yordamida ajratib olinadi.
- It is obtained from chlorides by the action of oxidizing agents.

9. U deyarli barcha elementlar bilan birika oladigan faol elementdir.
- It is a greenish yellow gas combining with nearly all elements.

10. Xlor kundalik ehtiyoj mollari ishlab chiqishda keng qo'llaniladi.
- Chlorine is widely used in making everyday products.

*****

11. U butun dunyoda toza ichimlik suvi ishlab chiqishda qo'llaniladi.
- It is used for producing safe drinking water in the world over.

12. Bugungi kunda hatto kichkina suv havzalari ham xlorlanadi.
- Now even the smallest water supplies are usually chlorinated.

13. Xlor qog'oz, tekstil sanoati, neft mahsulotlari ishlab chiqarishda keng qo'llaniladi.
- It is extensively used in the production of paper, textile, petroleum products.

14. Xlor tibbiy preparatlar, antiseptik dorilar, hashorotlarga qarshi kurash vositalari ishlab chiqishda ham qo'llanadi.
- Chlorine is also used in producing medicine, antiseptics and insecticides.

15. Xlor xloroform, uglerodli tetraxlorid ishlab chiqarishda va bromni ajratib olishda ham ishlatiladi.
- Chlorine is also used in the manifacture of chloroform, carbon tetrachloride and in the extraction of bromine.

*****

16. Organik kimyoda ham xlor juda zarur.
- It is needed much in organic chemestry too.

17. Xlor yallig'lantiruvchi vosita hisoblanadi.
- Chlorine is a respiratory irritant.

18. Gaz holidagi xlor nafas yo'llaridagi shilliq pardalarni yallig'lantiradi, suyuqligi esa terini kuydiradi.
- The gas irritates the mucus membranes and the liquid burns the skin.

19. 1915 yil urushda xlor gazi qurol sifatida ishlatilgan.	- In 1915 chlorine was used as a war gas.
20. Xlor organik birikmalar xilma-xil xususiyatlarga ega.	- Chlorine has many properties as an organic compound.

TEXT FOURTEEN: BROMINE

Bromine- Br_2 (Gr. bromos, stench). Discovered by Balard in 1826, but not prepared in quantity until 1860. A member of the halogen group of elements, it is obtained from natural brines from wells in Michigan and Arkansas. Little bromine is extracted today from seawater, which contains only about 85 ppm. Bromine is the only liquid nonmetallic element. It is a heavy, mobile, reddish-brown liquid, volatilizing readily at room temperature to a red vapour with a strong disagreeable odor, resembling chlorine, and having a very irritating effect on the eyes and throat; it is readily soluble in water or carbon disulfide, forming a red solution, is less active than chlorine but more so than iodine; it unites readily with many elements and has a bleaching action; when spilled on the skin it produces painful sores. It presents a serious health hazard, and maximum safety precautions should be taken when handling it. Much of the bromine output have been used in the production of ethylene dibromide, a lead scavenger used in making gasoline antiknock compounds. Lead in gasoline, however, has been drastically reduced, due to environmental considerations. This will greatly affect future production of bromine. Bromine is used in making fumigants, flameproofing agents, water purification compounds, dyes, medicinals, sanitizers, inorganic bromides for photography, etc. Organic bromides are also important.

G L O S S A R Y

1. *bromine – бром - brom*
2. *halogen group – галогенные группы - galogenli guruh*
3. *a red vapour – красный пара - qizil bug'*
4. *iodine – йода - yod*
5. *bleaching action – отбеливания действий - oqlovchi jarayon*

6. *ethylene – этилена - etilen*
7. *a lead scavenge – ведущий доедали - chiqindilarni chiqarib tashlovchi yetakchi qurilma*
8. *antiknock compounds – антидетонационные соединений - antidenotatsiya qo'shilmalari*
9. *gasoline – бензин - benzin*
10. *environmental considerations – экологические соображения - ekologik tushuncha*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Brom grekcha "bromos"degan so'zdan olingan va Br_2 belgisiga ega.	Bromine is taken from Grees and has the sign Br_2.
2. U Balard tomonidan 1826 yilda kashf qilingan.	It was discovered by Balard in 1826.
3. Ammo 1860 yilgacha uning xossalari aniqlanmagan.	But until 1860 it's not prepared in quantity.
4. U galogenlar guruhi elementlariga mansub.	It belongs to the hallogen group of elements.
5. Brom Michigan va Arkanzasdagi tuz quduqlaridan (konlaridan) tabiiy holda olinadi.	It is obtained from natural brines from wells in Michigan and Arkansas.
6. Bugungi kunda brom ozroq miqdorda dengiz suvlaridan olinadi.	At present little bromine is extracted from seawater.
7. Brom metallmaslar orasida yagona suyuq element hisoblanadi.	Bromine is the only liquid nonmetallic element.

8. U og'ir, harakatchan, qizg'ish jigarrang suyuqlikdir.	It is a heavy, mobile, reddish-brown liquid.
9. U uy haroratida kuchli noxush hidga ega qizil bug'ga aylanadi.	At room temperature it volatilizes to a red vapour with a strong disagreeable odor.
10. Brom ko'z va tomoqni yallig'lovchi kuchli ta'sirga ega.	Bromine has a very irritating effect on the eyes and throat.
11. U suv yoki uglerod disulfitda tez eriydi.	It is readily soluble in water or carbon disulfide.
12. Eriganda u qizil rangli eritmaga aylanadi.	When solves it takes a red form solution.
13. Brom xlordan faol emas, lekin yodga nisbatan faolroq.	Bromine is less active than chlorine, but more so than iodine.
14. Agar u teriga to'kilsa qattiq og'riq tug'diradi.	When spilled on the skin it produces painful sores.
15. U sog'lik uchun juda xavfli.	It presents a serious health hazard.
16. Ishlab chiqarilgan bromning ko'p miqdori etil dibromid olish uchun ishlatiladi.	Much of the bromine output have been used in the production of ethylene dibromide.
17. Brom dezinfeksiya qilishda, olov - ga chidamli moddalar ishlab chiqarishda ishlatiladi.	Bromine is used in making fumigants, flameproofing agents.
18. U fotografiya uchun anorganik bromidlar tayyorlashda ham ishlatiladi.	It is used in making inorganic bromides for photography too.
19. Bromorganik birikmalar ham juda muhim hisoblanadi.	Organic bromides are also very important.
20. Bromning qanday xususiyatlarini bilasiz?	What characteristic feature of bromine do you know?
21. Bromning xususiyatlari haqida gapirib bering.	Please, tell me about the features of bromine.

TEXT FIFTEEN: IODINE

Iodine- I_2(Gr. iodes, violet). Discovered by Courtois in 1811, Iodine, a halogen, occurs sparingly in the form of iodides in sea water from which it is assimilated by seaweeds, in Chilean saltpeter and nitrate-bearing earth, known as caliche in brines from old sea deposits, and in brackish waters from oil and salt wells. Ultrapure iodine can be obtained from the reaction of potassium iodide with copper sulfate. Several other methods of isolating the element are known. Iodine is a bluish-black, lustrous solid, volatizing at ordinary temperatures into a blue-violet gas with an irritating odor; it forms compounds with many elements, but is less active than the other halogens, which displace it from iodides. Iodine exhibits some metallic-like properties. It dissolves readily in chloroform, carbon tetrachloride, or carbon disulfide to form beautiful purple solutions. It is only slightly soluble in water. Thirty isotopes are recognized. Only one stable isotope, I[127] is found in nature. The artificial radioisotope I[131], with a half-life of 8 days, has been used in treating the thyroid gland. The most common compounds are the iodides of sodium and potassium (KI) and the iodates (KIO_3). Lack of iodine is the cause of goiter. Iodine compounds are important in organic chemistry and very useful in medicine. Iodides, and thyroxine which contains iodine, are used internally in medicine, and as a solution of KI and iodine in alcohol is used for external wounds. Potassium iodide finds use in photography. The deep blue color with starch solution is characteristic of the free element. Care should be taken in handling and using iodine, as contact with the skin can cause lesions; iodine vapor is intensely irritating to the eyes and mucus membranes. The maximum allowable concentration of iodine in air should not exceed 1 mg/m3 (8-hour time-weighted average - 40-hour).

G L O S S A R Y

1. *iodine – йод - yod*
2. *chilean saltpetre – чилийской селитры - chili selitrasi*
3. *nitrate-bearing earth – селитра-плодоношение земле - yer hosildorligini oshiruvchi selitra*

4. *caliche – селитры - selitra*
5. *ultrapure iodine – ультрачистый йод - o'ta sof yod, o'ta toza yod*
6. *potassium iodide – калий йодид - kaliy yodid*
7. *copper sulphate – сульфат меди - mis sulfati*
8. *lustrous solid – блестящие тверды – yaltirovchi qattiq massa*
9. *irritating odor – раздражающий запах - nafas yo'llarini achishtiruvchi hid*
10. *thyroid gland – щитовидной железы - qalqon bezlari*
11. *lesions – пораженний - jarohatlanish*
12. *iodine vapour – пар йода - yod bug'i*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Yodning kimyoviy belgisi I_2.	The chemical sign of iodine is I_2.
2. Yod Kurtua tomonidan 1811 yili kashf qilingan.	Iodine was discovered by Courtois in 1811.
3. Yod galoid hisoblanadi.	Iodine is a halogen.
4. Yod vodorod yodli kislota shaklida dengiz suvida uchraydi.	Iodine occurs in the form of iodides in seawater.
5. U dengiz o'tlari tomonidan o'z-lashtiriladi.	It is assimilated by seaweeds.

*****

6. Eski dengiz cho'kmalarida u smo-rodinasimon chili selitrasi nomi bilan mashhur.	It is known as caliche in brines from old sea deposits.
7. Yod tuz, neft quduqlar suvlarida uchraydi.	Iodine is found in brakish waters from oil and salt wells.

8. O’ta toza yod kaliy yodidni mis sulfati bilan reaksiyaga kirishishi natijasida olinadi.	Ultrapure iodine can be obtained from the reaction of potassium iodide with copper sulfate.
9. Yodni ajratishning bir necha usullari mavjud.	Several methods of isolating iodine are known.
10. Yod havorang qora yaltiroq modda.	Iodine is bluish-black, lusterous solid.

*****

11. Oddiy uy haroratida bug’lanib ko’k siyohrang (sapsar) o’tkir hidli gazga aylanadi.	At ordinary room temperature it volatizes into a blue-violet gas with irritating odor.
12. U ko’plab boshqa elementlar bilan lan birikmalar hosil qiladi.	It forms compounds with many elements.
13. Yodda bir qancha metallga xos xususiyatlar ham bor.	Iodine has some metallic like properties.
14. U xlorofom, uglerod tetraxlorid yoki uglerodli disulfidda eriydi va chiroyli siyohrang eritma hosil qiladi.	It dissolves in chloroform, carbon tetrachloride or carbon disulfide to form beautiful purple solution.
15. Yod suvda juda oz eriydi.	It is only slightly soluble in water.

*****

16. Yodning o’ttizta izotopi mavjud.	Iodine has thirty isotopes.
17. Tabiatda faqatgina bitta I [127] izotopi uchraydi.	Only one stable isotope I [127] is found in nature.
18. Yodni tabiatda eng ko’p uchraydigan birikmalari bu natriy va kaliy (KI) yodid hamda yoditlar (KlO_3) dir.	The most common compounds are the iodides of sodium and potassium (KI) and the iodates (KIO_3).
19. Yod tibbiyot uchun juda foydali.	Iodine is very useful in medicine.
20. Kaliy yodid fotografiyada ishlatiladi.	Potassium iodide is used in photography.

*****

21. Yod bilan muomala qilinganda,	Care should be taken in handling and

ya’ni ishlatishda ehtiyot bo’lish kerak.	using iodine.
22. Yod teriga tekkanda jarohat yetishi mumkin.	Iodine in contact with the skin can cause lesions.
23. Yodning bug’i ko’z va nafas shilliq pardalarini qattiq yallig’lantirishi mumkin.	Iodine vapor intensely irritates the eyes and mucus membranes.
24. Yodning havodagi yo’l qo’yilgan konsentratsiyasi 1 mg/m^3 dan oshmasligi kerak.	The maximum allowable concentration of iodine in the air should not exceed 1 mg/m^3 .
25. Siz yod haqida nimalarni o’rganib oldingiz?	What have you learned about iodine?

TEXT SIXTEEN: SODIUM

Sodium- Na (English, soda; Medieval Latin, sodanum, headache remedy) Long recognized in compounds, sodium was first isolated by Davy in 1807 by electrolysis of caustic soda. Sodium is present in fair abundance in the sun and stars. The D lines of sodium are among the most prominent in the solar spectrum. Sodium is the fourth most abundant element on earth, comprising about 2.6% of the earth's crust; it is the most abundant of the alkali group of metals. It is now obtained commercially by the electrolysis of absolutely dry fused sodium chloride. This method is much cheaper than that of electrolyzing sodium hydroxide, as was used several years ago. The most common compound is sodium chloride, but it occurs in many other minerals, such as soda niter, cryolite, amphibole, zeolite, etc. Sodium, like every reactive element, is never found free in nature. Sodium is a soft, bright, silvery metal which floats on water, decomposing it with the evolution of hydrogen and the formation of the hydroxide. It may or may not ignite spontaneously on water, depending on the amount of oxide and metal exposed to the water. It normally does not ignite in air at temperatures below 115^{o}C. Metallic sodium is vital in the manufacture of esters and in the preparation of organic compounds. The metal may be used to improve the structure of certain alloys, to descale metal, and to purify molten metals. An alloy of sodium with potassium,

NaK, is also an important heat transfer agent. Sodium compounds are important to the paper, glass, soap, textile, petroleum, chemical, and metal industries. Soap is generally a sodium salt of certain fatty acids. The importance of common salt to animal nutrition has been recognized since prehistoric times. Among the many compounds that are of the greatest industrial importance are common salt (NaCl), soda ash (Na_2CO_3), baking soda ($NaHCO_3$), caustic soda (NaOH), Chile saltpeter ($NaNO_3$), di- and tri-sodium phosphates, sodium thiosulfate (hypo, $Na_2S_2O_3 . 5H_2O$), and borax ($Na_2B_4O_7 . 10H_2O$). Thirteen isotopes of sodium are recognized. Sodium metal should be handled with great care. It cannot be maintained in an inert atmosphere and contact with water and other substances with which sodium reacts should be avoided.

G L O S S A R Y

1. *sodium – натрий - natriy*
2. *electrolysis of caustic soda – электролиз каустической соды - kaustik soda elektrolizi*
3. *prominent – известных - taniqli*
4. *the earth's crust – земной коры - yer qobig'i*
5. *the alkali group – щелочные группы - ishqorlar guruhi*
6. *soda niter – соды селитры - soda selitrasi*
7. *cryolite – криолит - kriolit*
8. *amphibole – амфибол - amfibol*
9. *zeolite – цеолит - tseolit*
10. *floats on water – плавает на воде - suvda cho'kmasdan (muallaq) turadi, suv yuzasiga qalqib chiqadi*
11. *esters – сложные эфиры - murakkab efirlar*
12. *of certain alloys – о некоторых сплавах - bir qator qotishmalar*
13. *purify molten metals – очистки жидких металлов - suyuq metallarni tozalash*
14. *fatty acids – жирных кислот - yog'li kislotalar*
15. *caustic soda – каустической соды - kaustik sodalar*

16. borax – бур - burgu, tog' parma

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Natriyning kimyoviy belgisi Na.	The chemical sign of sodium is Na.
2. U inglizcha "soda", lotin tilida "so-danum" deyiladi.	It is called "soda" in English and "sodanum" in Latin.
3. 1807 yilda Deyvi ilk bor natriy suyuq-lantirilgan kaustik sodani elektroliz qilish orqali ajratib olgan.	Sodium was first isolated by Davy in 1807 by electrolysis of caustic soda.
4. Natriy quyoshda va yulduzlarda ko'p uchraydi.	Sodium is present in fair abundance in the sun and stars.
5. Natriy yer yuzida eng ko'p uchray-digan elementlarning to'rtinchisidir.	Sodium is the fourth most abundant element on earth.

*****

6. U yer po'stlog'ini og'irlik jihatidan 2,6%ni tashkil qiladi.	It comprises 2,6% of the earth's crust.
7. Hozirda kommersiya maqsadida natriy quruq natriy xloridni suyuqlan-masini elektroliz qilish orqali olinadi.	Now it is obtained commercially by the electrolysis of absolutely dry sodium chloride.
8. Natriyning eng ko'p uchraydigan birikmasi natriy xloriddir.	The most common compound is sodium chloride.
9. U boshqa minerallar, jumladan, natriyli selitra, kriolit, amfibol, seolit tarkibida ham bor.	It occurs in many other minerals such as soda niter, cryolite, amphibole, zeolite and others.
10. U tabiatda hech qachon sof holda uchramaydi.	It is never found free in nature.

*****

11. Natriy kumush kabi oq, yumshoq metall.	Sodium is soft, bright, silvery metal.
12. Natriy suvda cho'kmaydi va suvni vodorod va gidroksidga ajratib tashlaydi.	Sodium floats on water and decomprises it with the evolution of hydrogen and the formation of hydrozide.
13. U 115^0Cdan past darajadagi issiqlikda havoda yonmaydi (olovlanib ketmaydi).	It does not ignite in air at temperature below 115^0C.
14. Metallsimon natriy efir ishlab chiqishda juda muhim.	Metallic sodium is vital in the manufacture of esters.
15. U organik birikmalar tayyorlashda ham muhim ahamiyat kasb etadi.	It is also important in the preparation of organic compounds.

*****

16. Natriyning kaliy bilan qotishmasi (NaK) ham muhim issiqlik uzatgich hisoblanadi.	An allog of sodium with potassium (NaK) is also an important heat transfer agent.
17. Natriyli birikmalar qog'oz, shisha, sovun, tekstil, neft, kimyo va metallurgiya sanoati uchun ham muhim.	Sodium compounds are important to the paper, glass, soap, textile, petroleum, chemical and metal industries.
18. Sovun, umuman olganda, bir qancha yog'li kislotalarning natriy tuzi hisoblanadi.	Soap is generally a sodium salt of certain fatty acids.
19. Natriyning o'n uchta izotopi mavjud.	Thirteen isotopes of sodium are recognized.
20. Natriyni suv va boshqa moddalar bilan reaksiyaga kirishuvidan saqlash lozim.	Sodium reacts with water and other substances should be avoided.

TEXT SEVENTEEN: POTASSIUM

Potassium- K (English, potash - pot ashes; L.. kalium, Arab qali, alkali). Discovered in 1807 by Davy, who obtained it from caustic potash (KOH); this was the first metal isolated by electrolysis. The metal is the seventh most abundant and

makes up about 2.4% by weight of the earth's crust. Most potassium minerals are insoluble and the metal is obtained from them only with great difficulty. Certain minerals, however, such as sylvite, carnallite, langbeinite, and polyhalite are found in ancient lake and sea beds and form rather extensive deposits from which potassium and its salts can readily be obtained. Potash is mined in Germany, New Mexico, California, Utah, and elsewhere. Large deposits of potash, found at a depth of some 3000 ft in Saskatchewan, promise to be important in coming years. Potassium is also found in the ocean, but is present only in relatively small amounts, compared to sodium. Potassium is never found free in nature, but is obtained by electrolysis of the hydroxide, much in the same manner as prepared by Davy. Thermal methods also are commonly used to produce potassium (such as by reduction of potassium compounds with CaC_2, C, Si, or Na). The greatest demand for potash has been in its use for fertilizers. Potassium is an essential constituent for plant growth and is found in most soils. An alloy of sodium and potassium (NaK) is used as a heat-transfer medium. Many potassium salts are of utmost importance, including the hydroxide, nitrate, carbonate, chloride, chlorate, bromide, iodide, cyanide, sulfate, chromate, and dichromate. It is one of the most reactive and electropositive of metals. Except for iridium, it is the lightest known metal. It is soft, easily cut with a knife, and is silvery in appearance immediately after a fresh surface is exposed. It rapidly oxidizes in air and must be preserved in a mineral oil such as kerosene. As with other metals of the alkali group, it decomposes in water with the evolution of hydrogen. It catches fire spontaneously on water. Potassium and its salts impart a violet color to flames. Seventeen isotopes of potassium are known. Ordinary potassium is composed of three isotopes, one of which is a radioactive isotope (K[40]) with a half-life of 1.28 E9 years.

G L O S S A R Y

1. *potassium – калий - kaliy*
2. *caustic potash – едкий калий - achchiq kaliy, o'yuvchi kaliy*
3. *insoluble – нерастворимых - erimaydigan*

4. *sylvite – сильвина - silvina*
5. *carnallite – карналлит - karnallit*
6. *thermal methods – термические методы - termik usullar*
7. *heat-transfer medium – передачу тепла - issiq uzatgich*
8. *bromide – метил - metil*
9. *iodide – хлоридно - xlorli*
10. *cyanide – цианид - tsianid*
11. *dichromate – дихромат - dixromat*
12. *rapidly oxidizes – быстро окисляет - tez oksidlanadi*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Kaliyning kimyoviy belgisi K.	The chemical sign of potassium is K.
2. Kaliy 1807 yil Deyvi tomonidan kashf qilingan.	Potassium was discovered in 1807 by Davy.
3. U kaliyni potashdan (KOH) (achchiq kaliydan) olgan.	He obtained potassium from caustic potash (KOH).
4. Bu elektroliz yo'li bilan olingan birinchi metaldir.	This is the first metal isolated by electrolysis.
5. Kaliy yer sathida eng ko'p uchraydigan yettinchi element.	Potassium is the seventh most abundant element on the earth's crust.

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6. Ko'pchilik kaliyli minerallar erimaydi.	Most potassium minerals are insoluble.
7. Shuning uchun ham metall ulardan qiyinchilik bilan ajratib olinadi.	That is why the metal is obtained from them with great difficulty.
8. Bir qator minerallar, masalan, silvin,	Certain minerals such as, silvite,

karnallit, langbenat, polixalit, qadimgi ko'l va dengiz tubida topilgan.	carnallite langbeinite, polyhalite are found in ancient lake and sea beds.
9. Ulardan kaliy va uning tuzlari tayyor holda olinishi mumkin.	Potassium and its salt can readily be obtained from them.
10. Kaliy Germaniya, Yangi Meksika, Kaliforniya, Utax va boshqa yerlarda qazib olinadi.	Potassium is mined in Germany, New Mexico, California, Utah and other places.

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11. Kaliy natriyli birikma holda okeanda ham topiladi.	Potassium can be found in the ocean compared to sodium.
12. Kaliy tabiatda sof holda uchramaydi.	Potassium is not found free in nature.
13. Kaliy eng ko'p miqdorda o'g'it sifatida ishlatiladi.	Potassium is mainly used as fertilizers.
14. U o'simliklarni o'sishi uchun muhim.	It is important for plant growth.
15. Kaliy izotoplaridan biri (K_{40}) radioaktiv.	One of the isotopes of potassium is radioactive. (K_{40})

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16. Ularga vodorod oksidi, ko'mir kislotasi tuzi, xlorid, xlorat, bromid, yodid, tsianid, nitratni kiritish mumkin.	Hydrooxide, carbonate, chloride, chlorate, bromide, iodide, cyaide, nitrate can be included in them.
17. U iridiydan tashqari eng yengil metal hisoblanadi.	It is the lightest known metal except iridium.
18. Havoda u tez oksidlanadi.	It rapidly oxidizes in air.
19. Kaliyning o'n yettita izotopi ma'lum.	Seventeen isotopes of potassium are known.
20. Kaliy va uning tuzlari yonganda siyohrang tusga kiradi.	Potassium and its salts impart a violet colour to flame.

TEXT EIGHTEEN: MAGNESIUM

Magnesium- Mg (Magnesia, district in Thessaly). Compounds of magnesium have long been known. Black recognized magnesium as an element in 1755. Davy isolated it in 1808 and Bussy prepared it in coherent form in 1831. Magnesium is the eighth most abundant element in the earth's crust. It does not occur uncombined, but is found in large deposits in the form of magnesite, dolomite, and other minerals. The metal is now principally obtained by electrolysis of fused magnesium chloride derived from brines, wells, and sea water. Magnesium is a light, silvery-white, and fairly tough metal. It tarnishes slightly in air, and finely divided magnesium readily ignites upon heating in air and burns with a dazzling white flame. Uses include flashlight photography, flares, and pyrotechnics, including incendiary bombs. It is one third lighter than aluminum, and in alloys is essential for airplane and missile construction. The metal improves the mechanical, fabrication, and welding characteristics of aluminum when used as an alloying agent. Magnesium is used in producing nodular graphite in cast iron, and is used as an additive to conventional propellants. It is also used as a reducing agent in the production of pure uranium and other metals from their salts. The hydroxide (milk of magnesia), chloride, sulfate (Epsom salts), and citrate are used in medicine. Dead-burned magnesite is employed for refractory purposes such as brick and liners in furnaces and converters. Organic magnesium is important in both plant and animal life. Chlorophylls are magnesium-centered perphyrins. The adult daily nutritional requirement, which is affected by various factors include weight and size, is about 300 mg/day. Because serious fires can occur, great care should be taken in handling magnesium metal, especially in the finely divided state. Water should not be used on burning magnesium or on magnesium fires.

G L O S S A R Y

1. *magnesium – магний - magniy*
2. *coherent form – последовательной форме - izchil shaklda*
3. *uncombined – несвязанном - bog'liq bo'lmagan holda*
4. *magnesite – магнезит - magnezit*

5. *dolomite – доломит - dolomit*
6. *tarnishes slightly – порочащих слегка - yengilroq xiralashadi*
7. *welding characteristics – сварочные характеристики - payvandlovchi xususiyatlari*
8. *nodular graphite – узловой графит, почковидный графит - qo'shilgan grafit, bo'yoqsimon grafit*
9. *conventional propellants – обычных топлив - odatdagi yoqilg'i*
10. *furnaces and converters – печей и конвертеров - pechkalar va konverterlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Magniyning kimyoviy belgisi Mg.	The chemical sign of magnesium is Mg.
2. Magneziiyli birikmalar uzoq vaqtdan ma'lum.	Compounds of magnesium have long been known.
3. Blek magniyni 1755 yilda kimyoviy kimyoviy element sifatida aniqlagan.	Black recognized magnesium as an element in 1755.
4. 1808 yilda Deyvi uni boshqa birik-malardan ajratib olgan.	In 1808 Davy isolated it from other its compounds.
5. 1831 yilda Bussi uni hozirgi shakl-da tayyorlagan.	And in 1831 Bussy prepared it in coherent form.

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6. Magniy yer qobig'ida tarqalganligi jihatidan sakkizinchi o'rinda turuv-chi elementdir.	Magnesium is the eight most abundant element in the earth's crust.
7. U magnezit, dolomit va boshqa mi-nerallar shaklida uchraydi.	It is found in the form of magne-site, dolomite and other minerals.

8. Bu metal hozirda suyuqlantirilgan magniy xloridni elektroliz qilish yo'li bilan olinadi.	The metal is now obtained by electrolysis of fused magnesium.
9. Magniy xlorid sho'r suvdan, quduqlardan va dengiz suvidan olinadi.	Magnesium is derived from brines, wells and seawater.
10. Magniy yengil, kumushrang oq, anchagina qattiq metall.	Magnesium is a light, silvery-white and fairly tough metal.

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11. Magniy fotografiyada pirotexnikada shuningdek, kuydiruvchi(yondiruvchi) bombalar tayyorlashda ishlatiladi.	Magnesium is used in photography, pyrotechnics, including incendiary bombs.
12. U aluminiydan uchdan bir marta engil.	It is one third lighter than aluminum.
13. Magniy buyraksimon grafit ishlab chiqishda ishlatiladi.	Magnesium is used in producing nodular graphite.
14. Magniy uning tuzlaridan metallar va sof uran olishda issiqlikni pasaytiruvchi vosita (agent) sifatida ham ishlatiladi.	Magnesium is also used in the production of pure uranium and other metals from their salts.
15. Vodorod oksidi (magniy suti), xlorid, sulfat (Epson tuzi) va limon kislotasi tuzi tibbiyotda ishlatiladi.	The hydroxide (milk of magnesium), chloride, sulfate (Epson salts) and citrate are used in medicine.

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16. Magniyli organik birikmalar o'simliklar va hayvonlar hayoti uchun juda muhim.	Organic magnesium is very important for both plant and animal life.
17. Magniyni kundalik oziq-ovqat ehtiyoji uchun ishlatilishi kuniga 350mg.	The adult daily nutritional requirement is about 350 mg/day.
18. Magniy metalini ishlatganda ehtiyot bo'lish kerak.	Great care should be taken in handling magnesium metal.
19. Magniyni yondirganda suv ishlatish	Whater should not be used on

mumkin emas.	burning magnesium.
20. Biz magniyning juda ko’p xususiyat-larini o’rganib oldik.	We have learned many features of magnesium.

TEXT NINETEEN: CALCIUM

Calcium- Ca(L. calx, lime). Though lime was prepared by the Romans in the first century under the name calx, the metal was not discovered until 1808. After learning that Berzelius and Pontin prepared calcium amalgam by electrolyzing lime in mercury, Davy was able to isolate the impure metal. Calcium is a metallic element, fifth in abundance in the earth's crust, of which if forms more than 3%. It is an essential constituent of leaves, bones, teeth, and shells. Never found in nature uncombined, it occurs abundantly as limestone, gypsum, and fluorite. Apatite is the fluorophosphate or chlorophosphate of calcium. The metal has a silvery color, is rather hard, and is prepared by electrolysis of the fused chloride to which calcium fluoride is added to lower the melting point. Chemically it is one of the alkaline earth elements; it readily forms a white coating of nitride in air, reacts with water, burns with a yellow-red flame, forming largely the nitride. The metal is used as a reducing agent in preparing other metals such as thorium, uranium, zirconium, etc., and is used as a deoxidizer, desulfurizer, or decarburizer for various ferrous and nonferrous alloys. It is also used as an alloying agent for aluminum, beryllium, copper, lead, and magnesium alloys, and serves as a "getter" for residual gases in vacuum tubes, etc. Its natural and prepared compounds are widely used. Quicklime (CaO), which is made by heating limestone that is changed into slaked lime by carefully adding water, is the great base of chemical refinery with countless uses. Mixed with sand it hardens as mortar and plaster by taking up carbon dioxide from the air. Calcium from limestone is an important element in Portland cement. The solubility of the carbonate in water containing carbon dioxide causes the formation of caves with stalagtites and stalagmites and is responsible for hardness in water. Other important compounds are the carbide, chloride, cyanamide, hypochlorite, nitrate, and sulfide.

G L O S S A R Y

1. *calcium – кальций - kalsiy*
2. *impure metal – нечистый металл - sof bo'lmagan metall*
3. *essential constituent – существенной составной - muhim ulama qism*
4. *bones – кости - suyaklar*
5. *abundantly as limestone – обильно, как известняк - ohakka o'xshash ko'p tarqalgan*
6. *thorium – тория - toriya*
7. *zirconium – циркония - tsirkoniya*
8. *lead – привести - yetakchilik, olib kelmoq*
9. *magnesium alloys – магниевых сплавов - magniyli (eritmalar) qotishmalar*
10. *quicklime – негашеная известь - so'ndirilmagan ohak*
11. *slaked lime – гашеная известь - so'ndirilgan ohak*
12. *portland cement – портландцемент - portland tsementi*
13. *cyanamide – цианамида - tsianamid*

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2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Kalsiyning kimyoviy belgisi Ca.	The chemical sign of calcium is Ca.
2. Bu metal 1808-yilgacha kashf qilinmagan.	This metal was not discovered until 1808.
3. Bertselius va Pontin kalsiy aralashmasini (smesini) ohakli simobda elektroliz qilish orqali tayyorlagan.	Berzelius and Pontin prepared calcium by electrolyzing lime in mercury.
4. Deyvi sof bo'lmagan kalsiyni olishga muvaffaq bo'ldi.	Davy was able to isolate the impure metal.
5. Kalsiy metallsimon elementir.	Calcium is a metallic element.

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6. U yer qobig'ida keng tarqalishi bo'yicha beshinchi o'rinda turadi.	It is the fifth in abundance in the earth's crust
7. U barglar, suyaklar va tishlarning eng muhim tarkibiy qismi.	It is an essential constituent of leaves, bones, and teeth.
8. Kalsiy ohaktosh, gips, fluorit (ftor) tarkibida keng tarqalgan.	It occurs abundantly as limestone, gypsum and fluorite.
9. Bu metall kumushrang tusga ega bo'lib, anchagina og'ir.	This metal has silvery color and is rather hard.
10. Suv bilan reaksiyaga kirishadi, yonganda sariq-qizil olovlanadi.	With water it reacts, burns with a yellow-red flame.

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11. U aluminiy, beriliy, mis, oltin tarkibli tuproq va magneziyli birikmalarni eritishda erituvchi agent (vosita) sifatida ham ishlatiladi.	It is also used as an alloying agent for aluminum, beryllium, copper, lead and magnesium alloys.
12. Qum bilan aralashtirilganda u qo'yilib, qurilish materiali va albasterga aylanadi.	Mixed with sand it hardens as mortar and plaster.
13. Kalsiyli muhim birikmalarga karbid, xlorid, tsianamid, gipoxlorid, nitrat (azot kislota tuzi) va sulfidlar kiradi.	Important calcium compounds are the carbide, chloride, cyanamide, hypochloride, nitrate and sulfide.
14. Ohaktoshdagi kalsiy Portland sementining muhim elementi hisoblanadi.	Calcium from limestone is an important element in Portland cement.
15. Kimyoviy jihatdan u yerdagi ishqorli elementlardan biri.	Chemically it is one of the alkaline earth elements.

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16. Siz kalsiy haqida nima bilasiz?	What do you know about calcium?
17. Kalsiyning kimyoviy belgisini yozing.	Write the chemical sign of calcium.
18. Ohak birinchi bor kim tomoni-	Whom was lime prepared first by?

dan ishlatilgan?

19. Kalsiy qanday element?	What kind of element is calcium?
20. Apatit pluorofosfat yoki kalsiy xlorofasfatdir.	Apatite is the fluorophosphate or chlorophosphate of calcium.

TEXT TWENTY: STRONTIUM

Strontium- Sr (Strontian, town in Scotland) Isolated by Davey byelectrolysis in 1808; however, Adair Crawford in 1790 recognizeda new mineral (strontianite) as differing from other barium minerals. Strontium is found chiefly as celestite and strontianite. The metal can be prepared by electrolysis of the fused chloride mixed with potassium chloride, or is made by reducing strontium oxide with aluminum in a vacuum at a temperature at which strontium distills off. Three allotropic forms of the metal exist, with transition points at 235 and 540oC. Strontium is softer than calcium and decomposes in water more vigorously. It does not absorb nitrogen below 380oC. It should be kept under kerosene to prevent oxidation. Freshly cut strontium has a silvery appearance, but rapidly turns a yellowish color with the formation of the oxide. The finely divided metal ignites spontaneously in air. Volatile strontium salts impart a beautiful crimson color to flames, and these salts are used in pyrotechnics and in the production of flares. Natural strontium is a mixture of four stable isotopes. Sixteen other unstable isotopes are known to exist. Of greatest importance is Sr[90] with a half-life of 29 years. It is a product of nuclear fallout and presents a health problem. This isotope is one of the best long-lived high-energy beta emitters known, and is used in SNAP (Systems for Nuclear Auxilliary Power) devices. These devices hold promise for use in space vehicles, remote weather stations, navigational buoys, etc., where a lightweight, long-lived, nuclear-electric power source is needed. The major use for strontium at present is in producing glass for color television picture tubes. It has also found use in producing ferrite magnets and in refining zinc. Strontium titanate is an interesting optical material as it has an extremely high refractive index and an optical

dispersion greater than that of diamond. It has been used as a gemstone, but is very soft. It does not occur naturally.

G L O S S A R Y

1. *strontium – стронций - stronsiy*
2. *vigorously – энергично - shijoatli, faol*
3. *spontaneously – спонтанно - birdaniga*
4. *space vehicles – космических аппаратов - kosmik apparatlar*
5. *gemstone – драгоценных камней - qimmatbaho toshlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Stronsiyning kimyoviy belgisi Sr.	The chemical sign of strontium is Sr.
2. U Deyvi tomonidan 1808 yilda elektroliz qilish yo'li bilan ajratib olingan.	It was isolated by Davy by electrolysis in 1808.
3. Undan avval boshqa bir olim Adair Kroford 1790 yil stronsiyni yangi mineral sifatida aniqlagan edi.	Before him other scientist Adair Crawford recognized it as a new mineral.
4. Stronsiy ko'proq selesten va stronsianat sifatida uchraydi.	Strontium is found chiefly as selestite and strontianite.
5. Bu metall suyultirilgan stronsiy xlorid va kaliy xloridlar aralashmasini elektroliz qilish orqali olinishi mumkin.	This metal can be prepared by electrolysis of the fused chloride mixed with potassium chloride.

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6. Bu metallning uchta allotropic shakli mavjud.	This metal has three allotropic form.
7. Stronsiy kalsiyga nisbatan yumshoqroq bo'lib, suvda tez erib	Strontium is softer than calcium and decomposes in water more

ketadi.	vigorously.
8. U 380^{o} Cdan past darajada azotni shimib olmaydi.	It does not absorb nitrogen below 380^{o} C.
9. Stronsiyni oksidlanmasligi uchun kerosinda saqlash kerak.	Strontium should be kept under kerosene to prevent oxidation.
10. Yangi kesilgan stronsiy kumush ko'rinishga ega.	Freshly cut strontium has a silvery appearance.

*****

11. U oksidlanishi natijasida tezda sarg'ish tusga kiradi.	It rapidly turns a yellowish color with the formation of the oxide.
12. Parchalanib ketgan stronsiy havoda tez alangalanib ketadi.	The finely divided metal ignites spontaneously in the air.
13. Tez bug'lanadigan stronsiy tuzlari to'q qizil (malina) rangda olovlanadi.	Volatile strontium salt impart a beautifully crimson color to flames.
14. Bu tuzlar pirotexnikada va yoritgichlar ishlab chiqishda ishlatiladi.	These salts are used in pyrotechnics and in the production of flares.
15. Tabiiy stronsiy to'rtta barqaror izotop aralashmasidir.	Natural strontium is a mixture of four stable isotopes.

*****

16. Yana o'n oltita barqaror bo'lmagan izotop ham mavjud.	Sixteen other unstable isotopes are also known to exists.
17. Uning Sr izotopi yordamchi yadro quvvati ishlab chiqish sistemalaridagi qurilmalarda ishlatiladi.	Its Sr isotope is used in devices of the systems for nuclear auxiliary power devices.
18. Hozirgi kunda stronsiy rangli televizorlar uchun rangli shisha truba ishlab chiqishda keng qo'llanilmoqda.	At present strontium is widely used in producing glass for color television picture tubes.
19. Stronsiy titanat ajoyib optic material hisoblanadi.	Strontium titanate is an interesting optical material.
20. U qimmatbaho tosh sifatida ham ish-	It has been used as a gemstone,

latilib kelingan, lekin u juda yumshoq. but is very soft.

TEXT TWENTY ONE: BARIUM

Barium- Ba (Gr. barys, heavy) Baryta was distinguished from lime by Scheele in 1774; the element was discovered by Sir Humphrey Davy in 1808. It is found only in combination with other elements, chiefly with sulfate and carbonate and is prepared by electrolysis of the chloride. Barium is a metallic element, soft, and when pure is silvery white like lead; it belongs to the alkaline earth group, resembling calcium chemically. The metal oxidizes very easily and should be kept under petroleum or other suitable oxygen-free liquids to exclude air. It is decomposed by water or alcohol. The metal is used as a "getter" in vacuum tubes. The most important compounds are the peroxide, chloride, sulfate, carbonate, nitrate, and chlorate. Lithopone, a pigment containing barium sulfate and zinc sulfide, has good covering power, and does not darken in the presence of sulfides. The sulfate, as permanent white is also used in paint, in X-ray diagnostic work, and in glassmaking. Barite is extensively used as a weighing agent in oil well drilling fluids, and is used in making rubber. The carbonate has been used as a rat poison, while the nitrate and chlorate give colors in pyrotechny. The impure sulfide phosphoresces after exposure to the light. All barium compounds that are water or acid soluble are poisonous. Naturally occurring barium is a mixture of seven stable isotopes. Twenty two other radioactive isotopes are known to exist.

G L O S S A R Y

1. *barium – барий - bariy*
2. *oxygen-free liquids – кислорода-свободные жидкости - erkin kislorodli suyuqliklar*
3. *peroxide – перекиси - pereoksid*
4. *lithopone – литопон - litopon*
5. *drilling fluids – буровые растворы - burg'ulashdagi eritmalar*
6. *rat poison – крысиный яд - kalamushlar uchun zahar*
7. *the impure sulfide – нечистые сульфидные - sof bo'lmagan sulfid*

8. poisonous – ядовито - zaharli

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Bariyning kimyoviy belgisi Ba.	The chemical sign of barium is Ba.
2. U grekcha "barys" so'zidan olingan bo'lib, "og'ir" degan ma'noni beradi.	It is taken from the Greek word and means "heavy".
3. U 1774 yilda Sheeli tomonidan ohakdan farq qiluvchi modda sifatida aniqlangan.	It was distinguished from lime by Sheele in 1774.
4. 1808 yil Xamfrey Devi tomonidan kimyoviy element sifatida kashf qilindi.	In 1808 it was discovered as a chemical element by Humphrey Davy.
5. U faqatgina boshqa elementlar bilan birgalikda birikma holida uchraydi.	It is found only in combination with other elements.

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6. U, asosan, sulfat va karbonat holida uchraydi.	It chietly exists with sulfate and carbonate.
7. Metal bariy xloridni elektroliz qilish orqali olinadi.	Barium is prepared by electrolysis of the chloride.
8. Bariy kumushsimon yaltiroq yunshoq metall.	Barium is a metallic soft element.
9. Sof bariy qo'rg'oshinga o'xshash, kumushsimon, oq tusli yumshoq metall.	Pure barium is silvery white like lead.
10. U juda tez oksidlanadi.	It oxidizes very easily.

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11. U havoni o'tkazmaydigan kislorodsiz suyuqliklarda saqlanishi lozim.	It should be kept under oxygen-free liquids to exclude air.

12. U suv yoki alkogolda parchalanib ketadi.	It decomposes in water or alcohol.
13. Uning eng muhim birikmalari peroksid, xlorid, sulfat karbonat, nitrat va xlorat hisoblanadi.	Peroxide, chloride, sulfate, carbonate, nitrate and chlorate are its the most important compounds.
14. Tarkibida bariy sulfat bo'lgan pigment litopon juda yaxshi qoplovchi kuchga ega.	Lithopone, a pigment containing barium has good covering power.
15. Bariy neft qazib olishda ishlatiladigan eritma tarkibida keng ishlatiladi.	Barium is extensively used in oil well drilling fluids.

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16. Bariy rezina ishlab chiqarishda ham ishlatiladi.	Barium is used producing rubber too.
17. Karbonat kalamushlarga qarshi zaharli dori sifatida ishlatiladi.	The carbonate is used as a rat poison.
18. Suvda va kislotada eriydigan barcha bariyli birikmalar zaharli.	All barium compounds that are water or acid soluble are poisonous.
19. Tabiatda uchraydigan bariy yettita barqaror izotoplar aralashmasidan iborat.	Naturally occurring barium is a mixture of seven stable isotopes.
20. Yana boshqa yigirma ikkitta radioaktiv izotopi ham ma'lum.	Twenty two other radioactive isotopes are known to exist.

TEXT TWENTY TWO: BERYLLIUM

Beryllium- Be (Gr. beryllos, beryl; also called Glucinium or Glucinum, Gr. glykys, (Gl) for its sweet but deadly taste.) Discovered as the oxide by Vauquelin in beryl and in emeralds in 1798. The metal was isolated in 1828 by Wohler and by Bussy independently by the action of potassium on beryllium chloride. Beryllium is found in some 30 mineral species, the most important of which are bertrandite, beryl, chrysoberyl, and phenacite. Aquamarine and emerald are precious forms of beryl. Beryl [$AlBe_3(Si_6O_{18})$], chrysoberyl (Al_2BeO_4) and bertrandite are the most

important commercial sources of the element and its compounds. Most of the metal is now prepared by reducing beryllium fluoride with magnesium metal. Beryllium metal did not become readily available to industry until 1957. The metal, steel gray in color, has many desirable properties. As one of the lightest of all metals, it has one of the highest melting points of the light metals. Its modulus of elasticity is about one third greater than that of steel. It resists attack by concentrated nitric acid, has excellent thermal conductivity, and is nonmagnetic. It has a high permeability to X-rays and when bombarded by alpha particles, as from radium or polonium, neutrons are produced in the amount of about 30 neutrons/million alpha particles. At ordinary temperatures, beryllium resists oxidation in air, although its ability to scratch glass is probably due to the formation of a thin layer of the oxide. Beryllium is used as an alloying agent in producing beryllium copper, which is extensively used for springs, electrical contacts, spot-welding electrodes, and non-sparking tools. It is applied as a structural material for high-speed aircraft, missiles, spacecraft, and communication satellites. Other uses include windshield frame, brake discs, support beams, and other structural components of the space shuttle. Because beryllium is relatively transparent to X-rays, ultra-thin Be-foil is finding use in X-ray lithography for reproduction of micro miniature integrated circuits. Beryllium is used in nuclear reactors as a reflector or moderator for it has a low thermal neutron absorption cross section. It is used in gyroscopes, computer parts, and instruments where lightness, stiffness, and dimensional stability are required. The oxide has a very high melting point and is also used in nuclear work and ceramic applications. Beryllium and its salts are toxic and should be handled with the greatest of care. Beryllium and its compounds should not be tasted to verify the sweetish nature of beryllium (as did early experimenters). The metal, its alloys, and its salts can be handled if certain work codes are observed, but no attempt should be made to work with beryllium before becoming familiar with proper safeguards.

G L O S S A R Y

1. *beryllium – бериллий - berilliy*
2. *in emeralds – в изумруды - zumradlar ichida*

3. *chrysoberyl – хризоберилл - xrizoberill*
4. *phenacite – фенакит - fenakit*
5. *emerald – изумрудно - zumradli*
6. *permeability – проницаемость - o'tkazuvchanlik*
7. *radium or polonium – радия и полония - radiy va poloniy*
8. *support beams – опоры - tayanchlar*
9. *stiffness – жесткость - shafqatsizlik*
10. *proper safeguards – меры - chora-tadbirlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Berilliyning kimyoviy belgisi Be.	The chemical sign of beryllium is Be.
2. Berilliy so'zi grek tilidan olingan bo'lib, "glucinium" ham deb ataladi.	Beryllium is taken from the Greek language and it is also called "glucinium"
3. Uning shirin ta'mi uchun "glykys" ham deyiladi.	For its sweet taste it is also called "glykys" (Gl).
4. U oksid sifatida Vaukvelin tomonidan 1798 yil beril va zumradda topilgan.	It was discovered as oxide by Vauquelin in beryl and emeralds
5. 1828 yil Voxler va Bussi tomonidan mustaqil ravishda metal sifatida ajratib olindi.	In 1828 it was isolated by Wohler and by Bussy independently as a metal.

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6. Berilliy o'ttizdan ortiq minerallar tarkibida uchraydi.	Beryllium is found in more than thirty mineral species.
7. Akvamarin va zumrad berilning eng qimmatbaho shakllaridir.	Aquamarine and emerald are precious forms of beryl.
8. Akvamarin ham zumrad kabi qim-	Aquamarine is also precious mi-

matbaho mineraldir.	neral like emerald.
9. 1957 yilgacha berilliy metalini sanoatda tayyorlashning iloji bo'lmagan.	Until 1957 beryllium did not become available to industry.
10. Bu metall po'latsimon kulrang tusda.	This metal is steel grey in color.

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11. Uning elastikligi po'latdan 3,1 marta kuchliroq.	Its elasticity is about one third greater than that of steel.
12. Uning ajoyib issiq o'tkazuvchanlik xususiyati bor.	It has excellent thermal conductivity.
13. Berilliy yuqori tezlikda uchuvchi samolyotlar, raketalar, kosmik kemalar va aloqa yo'ldoshlari uchun qurilish materiali sifatida ishlatiladi.	Beryllium is used as structured material for high-speed aircraft, missiles, spacecraft and communication satellites.
14. Berilliy yadro reaktorlarida reflektor yoki moderator sifatida ishlatiladi.	Beryllium is used in nuclear reactors as a reflector or moderator.
15. U giroskoplarda va kompyuter qismlarida ishlatiladi.	It is used in gyroscopes and computer parts.

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16. Berilliy va uning tuzlari zaharli.	Beryllium and its salts are toxic.
17. Berilliy bilan ehtiyotkor munosabatda bo'lish kerak.	Beryllium should be handled with great care.
18. Berilliy va uning birikmalarini tatib ko'rish mumkin emas.	Beryllium and its components should not be tasted.
19. Berilliy haqida nimalarni bilasiz?	What do you know about beryllium?
20. Berilliyning kommersiya uchun muhim bo'lgan qanday birikmalarini bilasiz?	What compounds of beryllium which are important for commerce do you know?

TEXT TWENTY THREE: CADMIUM

Cadmium-Cd (L. cadmia; Gr. kadmeia - ancient name for calamine, zinc carbonate) Discovered by Stromeyer in 1817 from an impurity in zinc carbonate. Cadmium most often occurs in small quantities associated with zinc ores, such as sphalerite (ZnS). Greenockite (CdS) is the only mineral of any consequence bearing cadmium. Almost all cadmium is obtained as a by-product in the treatment of zinc, copper, and lead ores. It is a soft, bluish-white metal which is easily cut with a knife. It is similar in many respects to zinc. Failure to appreciate the toxic properties of cadmium may cause workers to be unwittingly exposed to dangerous fumes. Silver solder, for example, which contains cadmium, should be handled with care. Serious toxicity problems have been found from long-term exposure and work with cadmium plating baths. Exposure to cadmium dust should not exceed 0.01 mg/m3 (8-hour time-weighted average, 40-hour week). The ceiling concentration (maximum), for a period of 15 min, should not exceed 0.14 mg/m3. Cadmium oxide fume exposure (8-hour, 40-hour week) should not exceed 0.05 mg/m3, and the maximum concentration should not exceed 0.05 mg/m3. These values are presently being restudied and recommendations have been made to reduce the exposure. In 1927 the International Conference on Weights and Measures redefined the meter in terms of the wavelength of the red cadmium spectral line (i.e. 1m = 1.553,164.13 wavelengths). This definition has been changed (see under Krypton). Cadmium is a component of some of the lowest melting alloys; it is used in bearing alloys with low coefficients of friction and great resistance to fatigue; it is used extensively in electroplating, which accounts for about 60% of its use. It is also used in many types of solder, for standard E.M.F. cells, for Ni-Cd batteries, and as a barrier to control nuclear fission. Cadmium compounds are used in black and white television phosphors and in blue and green phosphors for color TV tubes. It forms a number of salts, of which the sulfate is most common; the sulfide is used as a yellow pigment. Cadmium and solutions of its compounds are toxic.

G L O S S A R Y

1. *cadmium – кадмий - kadmiy*
2. *an impurity in zinc carbonate – примеси в карбонат цинка - karbonat ruh aralashmasi*
3. *zinc ores – цинковых руд - ruh rudalari*
4. *sphalerite – сфалерита - sfalerit*
5. *unwittingly – невольно - beixtiyor, behosdan*
6. *plating baths – покрытие ванны - vannaning qoplamasi*
7. *the exposure – экспозиции - ekspozitsiya*
8. *to fatigue – усталость - charchoq*
9. *nuclear fission – ядерного деления - yadro ajralishi*
10. *phosphors – люминофоры - lyuminaforlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Kadmiyning kimyoviy belgisi Cd.	The chemical sign of cadmium is Cd.
2. Kadmiy Shtromeyr tomonidan 1817 yilda kashf qilgan.	Cadmium was discovered by Stromeyer in 1817.
3. Kadmiy ko'proq rux rudalari bilan qo'shilgan birikma holida uchraydi.	Cadmium most often occurs in small quantities associated with zinc ores.
4. Sfalerit (ZnS) uning ana shunday birikmalaridan biri.	Sphalerite is one of such its compounds.
5. Deyarli barcha kadmiy rux, mis va qo'rg'oshin jinslarini ishlashda qo'shimcha mahsulot sifatida ishlab chiqiladi.	Almost all cadmium is obtained as a by-product in the treatment of zinc, copper and lead ores.

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6. Bu yumshoq, ko'kish oq metal.	It is a soft, bluish-white metal.
7. Kadmiyni pichoq bilan kesish mumkin.	Cadmium can be cut by the knife.

8. U ko’p jihatdan ruhga o’xshash.	It is similar in many respects to zinc.
9. Kadmiyning zaharli xususiyatlarini e’tiborga olmaslik ishchilarni xavfli holatga tushirib qo’yishi mumkin.	Failure to appreciate the toxic properties of cadmium may cause workers to be exposed to danger.
10. Tarkibida kadmiy bor kumush kavsharni ehtiyotkorlik bilan ishlatish kerak.	Silver solder which contains cadmium should be handled with care.

*****

11. Metall kadmiyning changini $1m^3$ dagi miqdori 0,01mg dan, o’tkir hidli kadmiy oksidi esa 0,05mgdan ortmasligi kerak.	Cadmium oxide fume exposure should not exceed 0.05 mg/m3, and the maximum concentration should not exceed 0.05 mg/m3.
12. Hozirda bular qayta o’rganib chiqildi va qadmiyning o’tkir hidi ta’sirini kamaytirish uchun choralar ishlab chiqilgan.	Now these have been restudied and recommendations have been made to reduce the cadmium dangerous fumes.
13. Kadmiy ba’zi eng past darajada eriydigan qotishmalarning tarkibiga kiradi.	Cadmium is a component of some of the lowest melting alloys.
14. Ishlab chiqariladigan kadmiyni 60% galvanic usulda metallarni qoplashga ishlatiladi.	It is used extensively in electroplating, which accounts for about 60% of its use.
15. U Ni-Cd batareyalari uchun standart E.M.F elementlari ishlab chiqishda qo’llanadi.	It is used in producing standard E.M.F. calls for Ni-Cd batteries.

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16. Kadmiyli birikmalar oq-qora rangli televizor yoritgichlarida ishlatiladi.	Cadmium compounds are used in black and white television phosphors.
17. Kadmiy va uning birikmalarining eritmalari zaharli.	Cadmium and its compounds solutions are toxic.
18. Kadmiy rangli televizorlarning havorang va yashil yoritgichlarida ham ishlatiladi.	Cadmium is also used in blue and green phosphors of color TV tubes.

TEXT TWENTY FOUR: ALUMINIUM

Aluminium- Al(L. alumen, alum) The ancient Greeks and Romans used alum as an astringent and as a mordant in dyeing. In 1761 de Morveau proposed the name alumine for the base in alum, and Lavoisier, in 1787, thought this to be the oxide of a still undiscovered metal. Wohler is generally credited with having isolated the metal in 1827, although an impure form was prepared by Oersted two years earlier. In 1807, Davy proposed the name aluminum for the metal, undiscovered at that time, and later agreed to change it to aluminum.The method of obtaining aluminium metal by the electrolysis of alumina dissolved in cryolite was discovered in 1886 by Hall in the U.S. and at about the same time by Heroult in France. Cryolite, a natural ore found in Greenland, is no longer widely used in commercial production, but has been replaced by an artificial mixture of sodium, aluminum, and calcium fluorides. Aluminum can now be produced from clay, but the process is not economically feasible at present. Aluminum is the most abundant metal to be found in the earth's crust (8.1%), but is never found free in nature. In addition to the minerals mentioned above, it is found in granite and in many other common minerals. Pure aluminum, a silvery-white metal, possesses many desirable characteristics. It is light, it is nonmagnetic and nonsparking, stands second among metals in the scale of malleability, and sixth in ductility. It is extensively used for kitchen utensils, outside building decoration, and in thousands of industrial applications where a strong, light, easily constructed material is needed. Although its electrical conductivity is only about 60% that of copper, it is used in electrical transmission lines because of its light weight. Pure aluminum is soft and lacks strength, but it can be alloyed with small amounts of copper, magnesium, silicon, manganese, and other elements to impart a variety of useful properties. These alloys are of vital importance in the construction of modern aircraft and rockets. Aluminum, evaporated in a vacuum, forms a highly reflective coating for both visible light and radiant heat. These coatings soon form a thin layer of the protective oxide and do not deteriorate as do silver coatings. They are used to coat telescope mirrors and to make decorative paper, packages, toys. The

compounds of greatest importance are aluminum oxide, the sulfate, and the soluble sulfate with potassium (alum). The oxide, alumina, occurs naturally as ruby, sapphire, corundum, and emery, and is used in glassmaking and refractories. Synthetic ruby and sapphire are used in lasers for producing coherent light.

G L O S S A R Y

1. *aluminium – алюминий - alyuminiy*
2. *astringent – вяжущее - tortishtiradigan, qamashtiradigan*
3. *mordant – язвительный - zaharli*
4. *an artificial mixture of sodium – искусственную смесь натрия - natriyning sun'iy aralashmasi*
5. *clay – глина - loy*
6. *malleability – податливость - mayishqoqlik*
7. *utensils – утварь - jihozlar*
8. *manganese – марганца - marganets*
9. *deteriorate – ухудшаться - yomonlashmoq*
10. *corundum – корунд - korund (qattiq mineral)*
11. *emery – шоколад - shokolad*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Alyuminiyning kimyoviy belgisi Al.	The chemical sign of aluminum is Al.
2. U lotincha "alumen" so'zidan olingan.	It is taken from the Latin word "alumen".
3. Qadimgi greklar va rimliklar undan foydalanishgan.	The ancient Greeks and Romans used it.
4. 1761 yil de Morveau uni "alumine" (alumina) deb atashni taklif qildi.	In 1761 de Morveau proposed the name "alumine".

5. 1787 yil Lavoyzer uni hali noma'lum bo'lgan metalning oksidi bo'lishi kerak dedi.	In 1787 Lavosier thought it to be the oxide of a still undiscovered metal.

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6. Voler 1827 yil alyuminiyni alohida ajratib oldi.	Vohler isolated aluminum in 1827.
7. Ammo undan ikki yil oldin Oerstad alyuminiyni sof bo'lmagan holda tayyorlagan edi.	But Oersted prepared the aluminum in the impure form two years earlier.
8. 1807 yil Deyvi hali kashf qilinmagan bu metallni alyuminiy deb taxmin qilgan.	In 1807 Davy proposed the name aluminum for this undiscovered metal.
9. Alyuminiyni elektroliz usulida 1886 yil AQSHlik Xoll kashf qilgan.	The method of obtaining aluminum was discovered by Hall in the USA.
10. Ayni shu yili Fransiyada Xeroult ham alyuminiyni kashf qilgan edi.	At about the same year Heroult from France also discovered it.

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11. Alyuminiy kriolitdan olingan.	Aluminum is obtained from cryolite.
12. Kriolit tabiiy ruda sifatida Grenlandiyada topilgan.	Cryolite, as a natural ore found in Greenland.
13. U yer yuzidagi eng ko'p tarqalgan metallardan.	It is one of the most abundant metal in the earth's crust.
14. Alyuminiy tabiatda hech qachon sof holda uchramaydi.	Aluminum is never found free in nature.
15. Sof alyuminiy kumushrang oq tusdagi yengil metall.	Pure aluminum is a silvery-white and light metal.

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16. U oshxona idish-tovoqlari, dekorativ qurilish materiallari tayyorlashda ishlatiladi.	It is used in producing kitchen utensils, decorative building constructions.
17. Uning elektr o'tkazuvchanligi misga	Its electrical conductivity is only about

qaraganda 60%ni tashkil qiladi.	60% that of copper.
18. Lekin u yengilligi tufayli elektr liniyalarida keng ishlatiladi.	But because of its weight it is mostly used in electrical transmission lines.
19. Alyuminiyli muhim birikmalarga aluminiy oksid, sulfat va kaliyli eriydigan sulfat (alum) kiradi.	The important compounds of aluminium are aluminum oxide, the sulfate and the soluble sulfate with potassium.
20. Alyuminiy va uning birikmalari shishasozlikda va olovga bardoshli qurilish materiallari ishlab chiqishda qo'llanadi.	Aluminum and its compounds are used in glassmaking and in the production of refractories .

TEXT TWENTY FIVE: ZINC

Zinc- Zn (German Zink, of obscure origin). Centuries before zinc was recognized as a distinct element, zinc ores were used for making brass. Tubal-Cain, seven generations from Adam, is mentioned as being an "instructor in every artificer in brass and iron." An alloy containing 87 percent zinc has been found in prehistoric ruins in Transylvania. Metallic zinc was produced in the 13th century A.D. in India by reducing calamine with organic substances such as wool. The metal was rediscovered in Europe by Marggraf in 1746, who showed that it could be obtained by reducing calamine with charcoal. The principal ores of zinc are sphalerite (sulfide), smithsonite (carbonate), calamine (silicate), and franklinite (zine, manganese, iron oxide). One method of zinc extraction involves roasting its ores to form the oxide and reducing the oxide with coal or carbon, with subsequent distillation of the metal. Naturally occurring zinc contains five stable isotopes. Sixteen other unstable isotopes are recognized. Zinc is a bluish-white, lustrous metal. It is brittle at ordinary temperatures but malleable at 100 to 150oC. It is a fair conductor of electricity, and burns in air at high red heat with evolution of white clouds of the oxide. It exhibits superplasticity. Neither zinc nor zirconium is ferromagnetic; but $ZrZn_2$ exhibits ferromagnetism at temperatures below 35K. It has unusual electrical, thermal, optical, and solid-state properties that have not been fully investigated. The metal is employed to form numerous alloys with other

metals. Brass, nickel silver, typewriter metal, commercial bronze, spring bronze, German silver, soft solder, and aluminum solder are some of the more important alloys. Large quantities of zinc are used to produce die castings, which are used extensively by the automotive, electrical, and hardware industries. An zink alloy, consisting of 78 percent zinc and 22 percent aluminum, is reported to be almost as strong as steel and as easy to mold as plastic. The alloy said to be so moldable that it can be molded into form using inexpensive ceramics or cement die casts. Zinc is also used extensively to galvanize other metals such as iron to prevent corrosion. Zinc oxide is a unique and very useful material for modern civilization. It is widely used in the manufacture of paints, rubber products, cosmetics, pharmaceuticals, floor coverings, plastics, printing inks, soap, storage batteries, textiles, electrical equipment, and other products. Lithopone, a mixture of zinc sulfide and barium sulfate, is an important pigment. Zinc sulfide is used in making luminous dials, X-ray and TV screens, and fluorescent lights. The chloride and chromate are also important compounds. Zinc is an essential element in the growth of human beings and animals. Tests show that zinc-deficient animals require 50 percent more food to gain the same weight as an animal supplied with sufficient zinc. Zinc is not considered to be toxic, but when freshly formed ZnO is inhaled a disorder known as the oxide shakes or zinc chills sometimes occurs. Where zinc oxide is encountered, recommendations include providing good ventilation to avoid concentration exceeding 5 mg/m^3, (time-weighted over an 8-hour exposure, 40-hour work week).

G L O S S A R Y

1. *zinc – цинк - rux*
2. *Tubal-Cain – Тубал-Каина - Tubal-Kaina*
3. *lustrous metal – блестящий металл - yaltiroq metal*
4. *malleable – вязко - yopishqoq*
5. *zirconium is ferromagnetic – циркония-ферромагнетик - tsirkoniy ferromagnetik*
6. *the automotive – автомобильная - avtomobilli*

7. *mold as plastic – формы, как пластик - shakli plastiksimon*
8. *extensively to galvanize – широко гальванизировать - keng galvanizatsiya qilmoq*
9. *prevent corrosion – предотвращения коррозии - korroziyani oldini olmoq, korroziyadan saqlamoq*
10. *lithopone – литопон - lipton*
11. *luminous dials – светящихся циферблатов - yaltiroq tsiferblatlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Ruxning kimyoviy belgisi Zn.	The chemical sign of zinc is Zn.
2. Bir necha asrlar avval rux alohida element sifatida farqlangan edi.	Centuries before zinc was recognized as a distinct element.
3. Rux minerallari latun (jez) ishlab chiqishda ishlatilgan.	Zinc ores were used for making brass.
4. Metallsimon rux XIII asrda Hindistonda ishlab chiqilgan.	Metallic zinc was produced in the XIIIth century A.D in India.
5. Bu metal 1746 yil Yevropada Margraf tomonidan qayta kashf qilindi.	This metal was rediscovered in Europe by Marggraf in 1746.

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6. Tabiiy holdagi ruxning oltita barqaror izotopi bor.	Naturally occurring zinc contains six stable isotopes.
7. Bundan tashqari, o'n oltita beqaror izotop ham aniqlangan.	Besides this sixteen unstable isotopes are also recognized.
8. Rux ko'kish oq, yaltiroq metall.	Zinc is a bluish-white, lustrous metal.
9. U odatdagi haroratda mo'rt bo'lib sinib ketadi, lekin 100 dan 150^{o}C gacha issiq-	It is brittle at ordinary temperatures, but malleable at 100 to 500^{o} C.

likda cho’ziluvchan.

10. Havoda baland qizil alanga berib yonadi va oq bulutga o’xshash oksid hosil qiladi.	It burns in air at high red heat with evolution of white clouds of the oxide.

*****

11. Rux boshqa metallarga qo’shilib, ko’plab qotishmaalar (spliv) hosil qiladi.	Zinc forms numeral alloys with other metals.
12. Latun (jez), nikelsimon kumush, bosma harf metali, kommersiya maqsadidagi bronza, yumshoq qalayi va aluminiy qalayi uning muhim birikmalari hisoblanadi.	Brass, nickel silver, soft solder and aluminum solder commercial bronze are its important alloys.
13. 78% rux va 22% aluminli qotishma juda baquvvat hisoblanadi.	A zinc alloy consisting 78% of zinc and 22% of aluminum is very strong.
14. U po’latdek mustahkam va uni plastikdek egish mumkin.	It is as strong as steel and as easy to mold as plastic.
15. Rux boshqa metallarning ustini qoplash uchun ishlatiladi.	Zinc is used to galvanize other metals.

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16. Masalan, temirni zanglashdan saqlash uchun rux bilan qoplanadi.	For example, in order to prevent corrosin the iron is galvanized with zinc.
17. Hozirgi taraqqiyot uchun rux juda ham foydali metall.	Zinc is very useful material for modern civilization.
18. U bo’yoqlar, rezina buyumlar, kosmetika, farmatsevtika mahsulotlari, pol qoplamalari, plastiklar, sovun, elektr asboblari ishlab chiqishda keng qo’llanadi.	It is widely used in producing of paints, rubber product, cosmetics, pharmaceuticals, floor coverings, plastics, soap, electrical equipment and others.
19. Rux sulfidi yorituvchi tsiferblatlar, rentgen va televizor ekranlari ishlab chiqishda ham ishlatiladi.	Zinc sulfide is used in making luminous dials, X-ray and TV screens.

20. Rux insonlar va hayvonlarlarning rivojlanishi uchun muhim elementdir.	Zinc is an essential element for the growth of human beings and animals.

TEXT TWENTY SIX: TITANIUM

Titanium-Ti(L. titans, the first sons of the Earth, mythology) Discovered by Gregor in 1791; named by Klaproth in 1795. Impure titanium was prepared by Nilson and Pettersson in 1887; however, the pure metal (99.9%) was not made until 1910 by Hunter by heating TiCl4 with sodium in a steel bomb. Titanium is present in meteorites and in the sun. Rocks obtained during the Apollo 17 lunar mission showed presence of 12.1% TiO_2 and rocks obtained during earlier Apollo missions show lower percentages. Titanium oxide bands are prominent in the spectra of M-type stars. The element is the ninth most abundant in the crust of the earth. Titanium is almost always present in igneous rocks and in the sediments derived from them. It occurs in the minerals rutile, ilmenite, and sphene, and is present in titanates and in many iron ores. Titanium is present in the ash of coal, in plants, and in the human body. The metal was a laboratory curiosity until Kroll, in 1946, showed that titanium could be produced commercially by reducing titanium tetrachloride with magnesium. This method is largely used for producing the metal today. The metal can be purified by decomposing the iodide. Titanium, when pure, is a lustrous, white metal. It has a low density, good strength, is easily fabricated, and has excellent corrosion resistance. It is ductile only when it is free of oxygen. The metal, which burns in air, is the only element that burns in nitrogen. Titanium is resistant to dilute sulfuric and hydrochloric acid, most organic acids, most chlorine gas, and chloride solutions. Natural titanium is reported to become very radioactive after bombardment with deuterons. The emitted radiations are mostly positrons and hard gamma rays. The metal is dimorphic. The hexagonal alpha form changes to the cubic beta form very slowly at about 880 ^{o}C. The metal combines with oxygen at red heat, and with chlorine at 550 ^{o}C. Titanium metal is considered to be physiologically inert. When pure, titanium dioxide is relatively clear and has an extremely high index of refraction with an optical dispersion higher than

diamond. Natural titanium consists of five isotopes with atomic masses from 46 to 50. All are stable. Eight other unstable isotopes are known. Titanium is important as an alloying agent with aluminum, molybdenum, manganese, iron, and other metals. Alloys of titanium are principally used for aircraft and missiles where lightweight strength and ability to withstand extremes of temperature are important. Titanium is as strong as steel, but 45% lighter. It is 60% heavier than aluminum, but twice as strong. Titanium has potential use in desalination plants for converting sea water into fresh water. The metal has excellent resistance to sea water and is used for propeller shafts, rigging, and other parts of ships exposed to salt water. A titanium anode coated with platinum has been used to provide cathodic protection from corrosion by salt water. It is produced artificially for use as a gemstone, but it is relatively soft. Star sapphires and rubies exhibit their asterism as a result of the presence of TiO_2. Titanium dioxide is extensively used for both house paint and artist's paint, because it is permanent and has good covering power. Titanium oxide pigment accounts for the largest use of the element. Titanium paint is an excellent reflector of infrared, and is extensively used in solar observatories where heat causes poor seeing conditions. Titanium tetrachloride is used to iridize glass. This compound fumes strongly in air and has been used to produce smoke screens.

G L O S S A R Y

1. *titanium – титан - titan*
2. *in igneous rocks – в изверженных породах - vulqon otilishida kelib chiqqan jinslarda*
3. *sediments – донных отложений - domna pechlari qoldiqlarida*
4. *a lustrous – блестящие - yaltiroq*
5. *a low density – низкой плотности - quyi qatlamlarda*
6. *good strength – хорошей прочностью - yaxshi mustahkamlilik*
7. *easily fabricated – легко сфабрикованы - yengil sohtalashtirilgan*
8. *dilute sulfuric – разбавленной серной кислоты - eritilgan oltingugurt kislotasi*

9. hard gamma rays - жесткие гамма-лучи - qattiq gamma nurlari

10. at red heat – на красное тепло - qizil issiqlik

11. for propeller shafts – для гребных валов - eshkak vallari uchun

12. rigging – такелаж - takellaj

13. asterism – астеризм - asterizm

14. titanium oxide – оксид титана - titan oksidi

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Titanning kimyoviy belgisi Ti.	The chemical sign of titanium is Ti.
2. Mifologiyada uni yerning birinchi o'g'li deyishadi.	In the mythology it is said the first son of the earth.
3. U 1791 yili Grigor tomonidan kashf qilingan.	It was discovered by Gregory in 1791.
4. 1795 yil Klapros unga nom bergan.	In 1795 Klaproth named it.
5. Toza bo'lmagan titan 1887 yil Nilson va Peterson tomonidan tayyorlangan.	Impure titanium was prepared by Nilson and Petterson in 1887.

*****

6. Titan sof holda 1910 yilgacha olinmagan.	The pure titanium was not made until 1910.
7. Titan meteoritlarda va quyoshda uchraydi.	Titanium is present in meteorites and in the sun.
8. Titan oksidi M-turdagi yulduzlar spektrida ko'rinib turadi.	Titanium oxide bands are prominent in the spectra of M-type stars.
9. Titan yer qobig'idagi eng ko'p tarqal-gan to'qqizinchi element hisoblanadi.	Titanium is the ninth most abundant in the crust of the earth.

10. Titan ko’mirning kulida, o’simliklarda va inson tanasida ham mavjud.

Titanium is present in the ash of coal, in plants and in the human body.

*****

11. 1946 yilda Kroll uni laboratoriya sharoitida oldi.

In 1946 Kroll could prepare it in the laboratory.

12. U kommersiya maqsadidagi titanni titan tetraxloridini magneziy ta’sirida achitish orqali tayyorlay oldi.

He could produce commercial titanium by reducing titanium tetrachloride with magnesium.

13. Bugungi kunda bu usul titan hosil qilishda keng qo’llanilmoqda.

Today this method is largely used for producing titanium.

14. Titan sof bo’lsa, yaltiroq oq metall holida bo’ladi.

Titanium, when pure, is a lustrous white metal.

15. Titan metali fiziologik jihatdan inert hisoblanadi.

Titanium metal is considered to be physiologically inert.

*****

16. Tabiiy titan atom massasi 46 dan 50 gacha bo’lgan beshta izotopdan iborat. Ularning barchasi barqaror.

Natural titanium consists of five isotopes with atomic masses from 46 to 50. All are stable.

17. Titanning yana sakkizta beqaror izotoplari ma’lum.

Eight other stable isotopes of titanium are known.

18. Titanning birikmalari samalyotsozlikda va raketa ishlab chiqishda foydalaniladi.

Alloys of titanium are used in construction of aircraft and missiles.

19. Titan po’latdek mustahkam, lekin 45% yengilroq.

Titanium is as strong as steel, but 45% lighter.

20. U alyumindan 60% og’irroq, lekin ikki barobar mustahkam.

It is 60% heavier than aluminum, but twice as strong.

*****

21. Titan dengiz suvini toza suvga aylantirishda ishlatiladi.

Titanium is used for converting sea water into fresh water.

22. U sun’iy qimmatbaho tosh ishlab chiqishda foydalaniladi.	It is product artificially for use as a gemstone.
23. Lekin u nisbatan yumshoq.	But it is relatively soft.
24. Titan tetraxlorid shishaga pardoz berishda ishlatiladi.	Titanium tetrachloride is used to iridize glass.
25. Bu birikma havoda kuchli tuta-gani uchun to’siq hosil qilishda ishlatiladi.	This compound fumes strongly in air and has been used to produce smoke screens.

TEXT TWENTY SEVEN: MERCURY

Mercury-Hg(Planet Mercury). Known to ancient Chinese and Hindus; found in Egyptian tombs of 1500 B.C. Mercury is the only common metal liquid at ordinary temperatures. It only rarely occurs free in nature. The chief ore is cinnabar, Spain and Italy produce about 50% of the world's supply of the metal. The commercial unit for handling mercury is the "flask," which weighs 76 lb. The metal is obtained by heating cinnabar in a current of air and by condensing the vapor. It is a heavy, silvery-white metal; a rather poor conductor of heat, as compared with other metals, and a fair conductor of electricity. It easily forms alloys with many metals, such as gold, silver, and tin, which are called amalgams. Its ease in amalgamating with gold is made use of in the recovery of gold from its ores. The most important salts are mercury chloride (corrosive sublimate - a violent poison), mercurous chloride (calomel, occasionally still used in medicine), mercury fulminate, a detonator widely used in explosives, and mercuric sulphide (vermilion, a high-grade paint pigment). Organic mercury compounds are important. It has been found that an electrical discharge causes mercury vapor to combine with neon, argon, krypton, and xenon. These products, held together with van der Waals' forces, correspond to HgNe, HgAr, HgKr, and HgXe. Mercury is a virulent poison and is readily absorbed through the respiratory tract, the gastrointestinal tract, or through unbroken skin. It acts as a cumulative poison and dangerous levels are readily attained in air. Air saturated with mercury vapor at

20oC contains a concentration that exceeds the toxic limit many times. The danger increases at higher temperatures. It is therefore important that mercury be handled with care. Containers of mercury should be securely covered and spillage should be avoided. It it is necessary to heat mercury or mercury compounds, it should be done in a well-ventilated hood. Methyl mercury is a dangerous pollutant and is now widely found in water and streams. The triple point of mercury, -38.8344 ^{o}C, is a fixed point on the International Temperature Scale (ITS-90). The metal is widely used in laboratory work for making thermometers, barometers, diffusion pumps, and many other instruments. It is used in making mercury-vapor lamps and advertising signs, etc. and is used in mercury switches and other electronic apparatus. Other uses are in making pesticides, cercury cells for caustic soda and chlorine production, dental preparations, anti-fouling paint, batteries, and catalysts.

G L O S S A R Y

1. *mercury – ртуть - simob*
2. *cinnabar – киновари - kinovar*
3. *flask – флягу - flyaga, flakon (suyuqlik quyadigan idish)*
4. *vapour – пар - bug'*
5. *amalgams – амальгамы - amalgamalar*
6. *mercury fulminate – гремучей ртути - qaldiroq simob*
7. *mercuric sulphide – сульфид ртути - simob sulfidi*
8. *krypton – криптона - kriton*
9. *xenon – ксенон - ksenon*
10. *diffusion pumps – диффузионные насосы - suvni sochib beradigan nasoslar*
11. *caustic soda – каустической соды - kaustik soda*
12. *dental preparations – стоматологические препараты - stomotologik preparatlar*
13. *anti-fouling paint – противообрастающих красок - o'sib ketishga qarshi bo'yoq*
14. *catalysts – катализаторов - katalizatorlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Simobning kimyoviy belgisi Hg.	The chemical sign of mercury is Hg.
2. U Merkuriy planetasi nomidan olingan.	It is taken from the name of the planet Mercury.
3. Simob qadimdan Xitoy va Hindistonda ma'lum bo'lgan.	Mercury is known to ancient Chinese and India.
4. U eramizdan avvalgi 1500 yillari Misr ehromlarida topilgan.	It was found in Egyptian tombs of 1500 B.C.
5. Simob oddiy haroratda (issiqlik sharoitidagi) yagona suyuq metalldir.	Mercury is the only common metal liquid at ordinary temperatures.

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6. Sof holda u tabiatda juda kam uchraydi.	It only rarely occurs free in nature.
7. Ispaniya va Italiya jahondagi simobga bo'lgan ehtiyojning 50% ni ishlab chiqadi.	Spain and Italy produce 50% of the world's supply of the metal.
8. Simob kinovarni havoda qizdirish orqali olinadi.	Mercury is obtained by heating cinnabar in a current of air.
9. U og'ir kumushrang metall.	It is a heavy silvery-white metal.
10. Boshqa metallarga nisbatan issiqlik o'tkazishi juda past.	It is a rather poor conductor of heat as compared with other metals.

*****

11. Simob boshqa metallar, masalan, oltin, kumush, qalay bilan qo'shilib birikmalar hosil qiladi. Ular amalgama deyiladi.	Mercury easily forms alloys with other metals such as gold, silver, tin. They are called amalgams.
12. Muhim simob tuzlariga simob xloridi va qaldiroq simob kiradi.	The important salts are mercury chloride and mercury fulminate.

13. Simob xloridi kuchli zahardir.	Mercury chloride is violent poison.
14. Qaldiroq simob detonator sifatida portlovchi modda tayyorlashda ishlatiladi.	Mercury fulminate as a detonator is widely used in explosives.
15. Simobning organik birliklari ham muhim.	Organic mercury compounds are also important.

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16. Simob sulfidi (kinovar) yuqori dara-jadagi bo'yoq pigmenti hisoblanadi.	Mercuric sulfide (vermilion) is a high grade paint pigment.
17. Simob kuchli zahar, nafas olish yo'llariga oson singib ketadi.	Mercury is a virulent poison and is easily absorbed through the respiratory track.
18. Simob bug'iga to'yingan havo hayot uchun xavfli.	The air saturated with mercury vapor is dangerous for life.
19. Simob termometr, barometr va boshqa asboblar ishlab chiqishda keng ishlatiladi.	Mercury is widely used in producing thermometers, barometers and other instruments.
20. Simob bug'i lampochkalar, reklama yoritgichlari va boshqa elektr asboblar ishlab chiqishda ishlatiladi.	Mercury vapor is used in producing lamps, advertising signs and other electronic apparatus.

TEXT TWENTY EIGHT: COPPER

Copper- Cu (Latin cuprum , from the island of Cyprus). It is believed that copper has been mined for 5,000 years. Copper is reddish and takes on a bright metallic luster. It is malleable, ductile, and a good conductor of heat and electricity (second only to silver in electrical conductivity). Copper occasionally occurs native, and is found in many minerals such as cuprite, malachite, azurite, chalcopyrite, and bornite. Large copper ore deposits are found in Chile, Zambia, Zaire, Peru, Canada and the U.S. The most important copper ores are the sulfides, the oxides, and carbonates. From these, copper is obtained by smelting, leaching, and by electrolysis. The electrical industry is one of the greatest users of copper.

Iron's alloys – brass and bronze -- are very important: most coins are copper alloys and gun metals also contain copper. Copper has wide use as an agricultural poison and as an algicide in water purification. Copper compounds, such as Fehling's solution, are widely used in analytical chemistry tests for sugar. High-purity copper (99.999+ percent) is available commercially.

G L O S S A R Y

1. *copper – медь - mis*
2. *reddish – красновато - qizg'ish*
3. *metallic luster – металлический блеск - metalsimon jilva (yarqirash)*
4. *malleable – вязко, yopishqoq - yelimshak*
5. *ductile – пластические - plastik, silliq*
6. *leaching – выщелачивания - ishqorli yuvish*
7. *brass – меди - mis*
8. *in water purification – для очистки воды - suvda tozalovchi*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Mis lotincha "cuprum" so'zidan olingan. Uning kimyoviy belgisi Cu.	Copper is taken from the Latin word "cuprum". Its chemical sign is Cu.
2. Mis besh ming yildan buyon qazib olinadi.	Copper has been mined for 5000 years.
3. Mis qizg'ish bo'lib, yorqin metal tusga kiradi.	Copper is reddish and takes on a bright metallic luster.
4. U cho'ziluvchan, elastik, issiqlik va elektrni yaxshi o'tkazadi.	It is malleable, ductile and good conductor of heat and electricity.
5. U elektr o'tkazuvchanlik jihatidan faqatgina kumushdan keyin turadi.	It takes only the second place in the electrical conductivity after silver.

*****

6. Mis ba’zan sof holda uchraydi va boshqa ko’p minerallar tarkibiga kiradi.	Copper occasionally occurs in nature and is found in many minerals.
7. U kuprit, malaxit, azurit va bornit kabi minerallar tarkibida uchraydi.	It is found in cuprites, malachite, azurite,bornite and in many other minerals
8. Mis rudasining katta konlari Chili, Zambiya, Zair, Peru, Kanada, AQSH va O’zbekistonda topilgan.	Large copper ore deposits are found in Chile, Zambia, Zaire, Peru, Canada, the USA and Uzbekistan.
9. Eng muhim mis rudalari bu sulfid, oksid va karbonatlardir.	The important copper ores are the sulfides, the oxides and carbonates.
10. Mis bu minerallardan eritish va elektroliz orqali olinadi.	The copper is obtained from these ores (minerals) by smelting and electrolysis

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11. Mis elektrotexnika sohasida eng ko’p qo’llaniladi.	The electrical industry is one of the greatest users of copper.
12. Jez va bronza eng muhim birikmalari hisoblanadi.	Brass and bronze are very important compounds.
13. Ko’plab tangalar mis birikmalaridan tayyorlanadi.	Most of the coins are made from copper alloys.
14. Qurol-yaroq metallari tarkibida ham mis bor.	The gun metals are also contain copper.
15. Mis birikmalari qishloq xo’jaligida zaharli dori sifatida ko’p ishlatiladi.	Copper is widely used in agriculture as an agricultural poison.

*****

16. Mis birikmalari analitik kimyoda ham keng ishlatiladi.	Copper compounds are also widely used in analytical chemistry.
17. Yuqori daraja soflikdagi mis (99.999%) kommersiya (savdo) maqsadlarida ishlatiladi.	High-purity copper (99.999%) is used for commercial purposes.
18. Siz misning xususiyatlari haqida	What do you know about the

nima bilasiz?	characteristic features of copper?
19. Mis konlari ko'proq qaysi mamlakatlarda uchraydi?	In what countries are large deposites of copper found?
20. Misning kimyoviy belgisini yozib bering.	Please, write the chemical sign of copper.

TEXT TWENTY NINE: SILVER

Silver- Ag (Anglo-Saxon, Seolfor siolfur; L. argentum). Silver has been known since ancient times. It is mentioned in Genesis. Slag dumps in Asia Minor and on islands in the Aegean Sea indicate that man learned to separate silver from lead as early as 3000 B.C. Silver occurs native and in ores such as argentite (Ag_2S) and horn silver (AgCl); lead, lead-zinc, copper, gold, and copper-nickel ores are principal sources. Mexico, Canada, Peru, and the U.S. are the principal silver producers in the western hemisphere. Silver is also recovered during electrolytic refining of copper. Commercial fine silver contains at least 99.9% silver. Purities of 99.999% are available commercially. Pure silver has a brilliant white metallic luster. It is a little harder than gold and is very ductile and malleable, being exceeded only by gold and perhaps palladium. Pure silver has the highest electrical and thermal conductivity of all metals, and possesses the lowest contact resistance. It is stable in pure air and water, but tarnishes when exposed to ozone, hydrogen sulfide, or air containing sulfur. The alloys of silver are important. Sterling silver is used for jewelry, silverware, etc. Where appearance is paramount. This alloy contains 92.5% silver, the remainder being copper or some other metal. Silver is of the utmost importance in photography. It is used for dental alloys. Silver is used in making solder and brazing alloys, electrical contacts, and high capacity silver-zinc and silver-cadmium batteries. Silver paints are used for making printed circuits. It is used in mirror production and may be deposited on glass or metals by chemical deposition, electrode position, or by evaporation. When freshly deposited, it is the best reflector of visible light known, but is rapidly tarnished and loses much of its reflectance. It is a poor reflector of ultraviolet. Silver fulminate, a powerful

explosive, is sometimes formed during the silvering process. Silver iodide is used in seeding clouds to produce rain. Silver chloride has interesting optical properties as it can be made transparent; it also is a cement for glass. Silver nitrate, or lunar caustic, the most important silver compound, is used extensively in photography. Silver for centuries has been used traditionally for coinage by many countries of the world. In recent times, however, consumption of silver has greatly exceeded the output. While silver itself is not considered to be toxic, most of its salts are poisonous. Exposure to silver (metal and soluble compounds, as Ag) in air should not exceed 0.01 mg/m3, (8-hour time-weighted average – 40 hour week). Silver compounds can be absorbed in the circulatory system and reduced silver deposited in the various tissues of the body. A condition, known as argyria, results with a grayish pigmentation of the skin and mucous membranes. Silver has germicidal effects and kills many lower organisms effectively without harm to higher animals.

G L O S S A R Y

1. *silver – серебро - kumush*
2. *slag dumps – свалки шлака - shlak uyumlari (ko'mir yongandagi chiqindi)*
3. *to separate silver – отделить серебро - kumushni ajratib olish*
4. *such as argentite – такой как аргентит - argentitga o'xshash*
5. *horn silver – роговое серебро - shohsimon kumush*
6. *lead-zinc – свинцовый цинк - qo'rg'oshinli ruh*
7. *principal sources – основные источники - asosiy manbalar*
8. *purities – чистота - soflik*
9. *ductile and malleable – податливый и покорный - yumshoq va egiluvchan*
10. *palladium – палладий - palladiy*
11. *the lowest contact resistance – свяжитесь с сопротивлением - eng past qarshilikka ega*
12. *tarnishes – тусклость - xiralanish*
13. *sterling silver – чистое серебро - sof kumush*
14. *appearance is paramount – появление главное - ko'rinish kerakli bo'lgan joy*

15. *printed circuits – печатные схемы - bosma jadval, nashr etilgan jadval*
16. *evaporation – испарение - bug'lanish*
17. *reflectance. – коэффициент отражения - aks etish koeffitsienti*
18. *silver fulminate – серебряный фульминат - kumush fulminat*
19. *transparent – прозрачный - tiniq, shaffof*
20. *lunar caustic - ляпис - lyapis, jahannam toshi*
21. *coinage – чеканка - tanga zarb qilish*
22. *exposure to silver in air – выставление серебра в воздухе - kumushni ochiq havoda qoldirish*
23. *the various tissues – различные ткани - turli xil to'qimalar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Kumushning kimyoviy belgisi Ag.	The chemical sign of silver is Ag.
2. Kumush qadim zamonlardan ma'lum.	Silver has been known since ancient times.
3. Odamlar qo'rg'oshindan kumush ajratib olishni eramizdan oldingi 3000-yillarda o'rganganlar.	People learned to separate silver from lead in the 3000th B.C
4. Qo'rg'oshin, mis, oltin, qo'rg'oshin-rux va mis-nikel rudalari kumushning asosiy manbalaridir.	Lead, copper, gold, lead-zinc and copper-nickel ores are principal sources of silver.
5. Meksika, Kanada, Peru va AQSH dunyodagi asosiy kumush ishlab chiquvchi mamlakatlar hisoblanadi.	Mexico, Canada, Peru and the USA are the main silver producing countries in the world.

*****

6. Savdoga chiqarish uchun mo'ljallangan	Commercial fine silver contains at

kumush eng kamida 99,9% li bo'ladi.	least 99,9% silver.
7. Sof, toza kumush brilliantsimon oq metallik yaltiroq tusga ega.	Pure silver has a brilliant white metallic luster.
8. U oltindan qattiqroq.	It is harder than gold.
9. Sof, toza kumush issiqlik va elektr tokini yuqori darajada o'tkazish qobiliyatiga ega.	Pure silver has the highest electrical and thermal conductivity.
10. U havoda va suvda barqaror.	It is stable in air and water.

*****

11. Toza kumush zargarlikda va kumush taqinchoqlarda ishlatiladi.	Sterling silver is used in jewelery and silverware.
12. Kumush birikmalari fotografiyada (sur'atkashlikda) ahamiyati katta.	Silver is very important in photography.
13. Kumush katta sig'imdagi kumush-rux va kumush-qadmiy batareyalari ishlab chiqishda ishlatiladi.	Silver is used in producing high capacity silver-zinc and silver cadmium batteries.
14. Kumush ko'zgu ishlab chiqarishda ham ishlatiladi.	Silver is used in mirror production too.
15. Kumush xlorid ajoyib optic xususiyatlarga ega.	Silver chloride has interesting optical properties.

*****

16. Kumush asrlar mobaynida jahondagi ko'plab mamlakatlarda tanga ishlab chiqishda foydalanib kelingan.	Silver for centuries has been used for coinage by many countries of the world.
17. Kumushning o'zi zaharli emas, ammo uning tuzlari zaharli.	Silver itself is not considered to be toxic, but its salts are poisonous.
18. Kumush ozon ta'sirida xiralashib qoladi.	Silver tarnishes when exposed to ozone.
19. Kumushning qanday xususiyatlarini bilasiz?	What properties of silver do you know?

20. Kumush qaysi mamlakatlarda ko’p uchraydi?	In what countries is silver mostly found?

TEXT THIRTY: GOLD

Gold- Au(Sanskrit Jval; Anglo-Saxon gold; L. aurum, gold) Known and highly valued from earliest times, gold is found in nature as the free metal and in tellurides; it is very widely distributed and is almost always associated with quartz or pyrite. It occurs in veins and alluvial deposits, and is often separated from rocks and other minerals by mining and panning operations. About two thirds of the world's gold output comes from South Africa. The metal is recovered from its ores by cyaniding, amalgamating, and smelting processes. Refining is also frequently done by electrolysis. Gold occurs in sea water to the extent of 0.1 to 2 mg/ton, depending on the location where the sample is taken. As yet, no method has been found for recovering gold from sea water profitably. It is estimated that all the gold in the world, so far refined, could be placed in a single cube 60 ft. on a side. Of all the elements, gold in its pure state is undoubtedly the most beautiful. It is metallic, having a yellow color when in a mass, but when finely divided it may be black, ruby, or purple. The Purple of Cassius is a delicate test for auric gold. It is the most malleable and ductile metal; 1 oz. of gold can be beaten out to 300 ft2. It is a soft metal and is usually alloyed to give it more strength. It is a good conductor of heat and electricity, and is unaffected by air and most reagents. It is used in coinage and is a standard for monetary systems in many countries. It is also extensively used for jewelry, decoration, dental work, and for plating. It is used for coating certain space satellites, as it is a good reflector of infrared and is inert. The most common gold compounds are auric chloride and chlorauric acid, the latter being used in photography for toning the silver image. Gold has 18 isotopes; Au[198], with a half-life of 2.7 days, is used for treating cancer and other diseases. Disodium aurothiomalate is administered intramuscularly as a treatment for arthritis. A mixture of one part nitric acid with three of hydrochloric acid is called aqua regia (because it dissolved gold, the King of Metals). Gold is available commercially

with a purity of 99.999%. For many years the temperature assigned to the freezing point of gold has been 1063.0 ^{o}C; this has served as a calibration point for the International Temperature Scales (ITS-27 and ITS-48) and the International Practical Temperature Scale (IPTS-48). In 1968, a new International Practical Temperature Scale (IPTS-68) was adopted, which demands that the freezing point of gold be changed to 1064.43 ^{o}C. The specific gravity of gold has been found to vary considerably depending on temperature, how the metal is precipitated, and cold-worked.

G L O S S A R Y

1. *gold – золото* - *oltin*
2. *amalgamating – соединение* - *qo'shilma, birikma*
3. *water profitably – оросите с пользой* - *foydali sug'orish*
4. *malleable and ductile metal – покорный и податливый металл* - *yumshoq va egiluvchan metall*
5. *in coinage – в чеканке монет* - *tanga zarb qilishda*
6. *monetary systems – денежные системы* - *pul tizimi*
7. *satellites – спутники* - *yo'ldoshlar*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Oltinning kimyoviy belgisi Au.	The chemical sign of gold is Au.
2. Oltin Anglo-sakson tilida "gold", lotin tilida "aurum" deyiladi.	In Anglo-Saxon it is called "gold" and in Latin "aurum".
3. U qadimdan ma'lum va yuqori darajada qimmatga ega.	It is known from ancient times and highly valued.
4. U tabiatda erkin holda uchraydigan metall.	In nature it is found as the free metal.

5. U metallarning telluridlar guruhiga mansub.	It belongs to telluride group of metals.

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6. Jahondagi oltinning uchdan ikki qismi Janubiy Afrikadan olinadi.	About two thirds of the world's gold comes from South Africa.
7. Oltin boshqa rudalardan tsianid, amalgamlash (biriktirish) orqali ajratib olinadi.	The gold is recovered from its ores by cyaniding and amalgamating.
8. Tozalash ba'zida elektroliz orqali ham bajariladi.	Refining is also frequently done by electrolysis.
9. Oltin dengiz suvining bir tonnasida 0,1 dan 2 mg gacha uchraydi.	Gold can be found in the sea water to the extent of 0,1 to2 mg/ton.
10. Ammo hozirgacha dengiz suvidan oltinni ajratib olish usuli topilgani yo'q.	But no method has been found for revering gold from sea water.

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11. Barcha metallardan oltin o'zining sof holiga ko'ra eng chiroylisi.	Of all the elements gold in its pure state is undoubtedly the most beautiful
12. Oltin sariq rangdagi yumshoq metall.	Gold is soft yellow metal.
13. Oltin issiqlik va elektr tokini yaxshi o'tkazish xususiyatiga ega.	Gold is a good conductor of heat and electrocity.
14. U havo va boshqa ko'pchilik reagentlar bilan ta'sirlashmaydi.	It is unaffected by air and most reagents.
15. Oltin ko'plab mamlakatlarda tanga ishlab chiqarishda foydalaniladi.	It is used in coinage in many countries.

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16. Oltin ko'plab mamlakatlar pul tizimida (standart) o'lchov mezoni hisoblanadi.	Gold is a standard for monetary systems in many countries.
17. Oltin zargarlikda, bezak ishlarida, tish yasashda keng qo'llaniladi.	Gold is extensively used for jewelery, decoration and dental work.
18. Eng muhim oltin birikmalariga auroxlorid va xloraurat kislotalarini kiritish	The most important gold compounds are auric chloride, and chlorauric acid.

mumkin.

19. Oltinning o’n sakkizta izotopi bor.	Gold has eighteen isotopes.
20. Oltin Au [198] rak va boshqa kasalliklarni davolashda ishlatiladi.	Gold Au [198] is used for treating caner and other diseases.

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21. Oltin qaysi metallar bilan birgalikda uchraydi?	What metals is gold associated with?
22. Oltin qayerda ko’plab ishlatiladi?	Where is gold mostly used?
23. Oltinning qaysi asosiy xususiyatlarini bilasiz?	What proportion of gold do you know?
24. Oltinning nechta izotopi bor?	How many isotopes does gold have?
25. Kommersiya maqsadida oltinning sofligi necha foizni tashkil qiladi?	What is the commercially available purity of gold?

TEXT THIRTY ONE: NICKEL

Nickel- Ni (German Nickel, Satan or Old Nick's and from kupfernickel, Old Nick's copper). Cronstedt discovered nickel in 1751 in kupfernickel (niccolite). Nickel is found as a constitutent in most meteorites and often serves as one of the criteria for distinguishing a meteorite from other minerals. Iron meteorites, or siderites, may contain iron alloyed with from 5 percent to nearly 20 percent nickel. Nickel is obtained commercially from pentlandite and pyrrhotite of the Sudbury region of Ontario, a district that produces about 30 percent of the world's supply of nicke. Other deposits are found in New Caledonia, Australia, Cuba, Indonesia, and elsewhere. Nickel is silvery white and takes on a high polish. It is hard, malleable, ductile, somewhat ferromagnetic, and a fair conductor of heat and electricity. It belongs to the iron-cobalt group of metals and is chiefly valuable for the alloys it forms. It is extensively used for making stainless steel and other corrosion-resistant alloys such as Invar(R), Monel(R), Inconel(R), and the Hastelloys(R). Tubing made of copper-nickel alloy is extensively used in making desalination plants for converting sea water into fresh water. Nickel, used extensively to make coins and

nickel steel for armor plates and burglar-proof vaults, and is also a component in Nichrome(R), Permalloy(R), and constantan. Nickel gives glass a greenish color. Nickel plating is often used to provide a protective coating for other metals, and finely divided nickel is a catalyst for hydrogenating vegetable oils. It is also used in ceramics, in the manufacture of Alnico magnets, and in the Edison(R) storage battery. The sulfate and the oxides are important compounds. Natural nickel is a mixture of five stable isotopes; nine other unstable isotopes are known. Exposure to nickel metal and soluble compounds (as Ni) should not exceed 0.05 mg/cm3 (8-hour time-weighted average - 40-hour work week). Nickel sulfide fume and dust is recognized as being potentially carcinogenic.

G L O S S A R Y

1. *nickel – никель - nikel*
2. *for distinguishing a meteorite – для того, чтобы отличить метеорит - meteoritni farqlash uchun*
3. *ductile – податливый - yumshoq egilib bukiluvchi*
4. *ferromagnetic – ферромагнетик - ferromagnetik*
5. *invar – инвар - invar*
6. *desalination plants – опреснительные установки - suyuqlik sepadigan qurilmalar*
7. *burglar-proof vaults – стальные сейфы - po'lat seyflar*
8. *for hydrogenating vegetable oils – для того, чтобы гидрогенизировать растительные масла - o'simlik yog'larini gidrogenizatsiya qilish uchun*
9. *potentially carcinogenic - потенциально канцерогенный - potensial karsiogenik*

Tasks*:* 1. Read the text and translate it by the help of the given vocabulary (matnni o'qing va berilgan so'zlar yordamida uni tarjima qiling)

2. Answer the questions (Berilgan savollarga javob bering)

3. Summarize of the text/ write the short meaning of the text (Matnni qisqacha mazmunini aytib (yozib) bering)

4. Seans (Seans) o'zbekcha - inglizcha 20 ta

1. Nikelning kimyoviy belgisi Ni.	The chemical sign of nickel is Ni.
2. Kronsted nikelni 1751 yil kashf qilgan.	Cronstedt discovered nickel in 1751.
3. Nikel ko'plab meteoritlar tarkibida uchraydi.	Nickel is found in many minerals.
4. Nikel meteoritni boshqa minerallardan farqlovchi kriteriya bo'lib xizmat qiladi.	Nickel serves as the criteria for distinguishing a meteorite from other minerals.
5. Temir meteoritlarda besh foizdan yigirma foizgacha nikel mavjud.	Iron meteorites contain from 5% to 20% nickel.

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6. Kommersiya maqsadidagi nikel pentlandit va pirxotitdan olinadi.	Nickel is obtained commercially from pentlandite and pyrrhotite.
7. Ular Ontarioning Sadbyuri (viloyatida) regionida topilgan.	They are found is Sudbury region of Ontario.
8. Bu jahonda ishlab chiqarilayotgan nikelning 30%ni tashkil qiladi.	This district produces about 30% of the world's supply of nickel.
9. Nikel olinadigan qazilma boyliklar Yangi Kaledoniya, Avstraliya, Kuba, Indoneziya va boshqa joylardan topilgan.	Other deposits of nickel are found in New Caledonia, Australia, Cuba, Indonesia and elsewhere.
10. Nikel kumushrang oq metall bo'lib, u metallarning temirkobalt guruhiga mansub.	Nickel is silvery white metal and it belongs to the group of iron-cobalt metals.

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11. Uning boshqa metallar bilan birikmalari qimmatbaho hisoblanadi.	Its alloys are chiefly valuable.
12. Nikel zanglamaydigan po'lat tayyorlashda keng ishlatiladi.	Nickel is extensively used for making stainless steel.
13. Mis-nikel qotishmasi suvidan chuchuk suv tayyorlovchi qurilmalar uchun (quvurlar) tayyorlashda keng foydala-	Tubing made of copper-nickel alloy is extensively used in making desalination plants for converting sea water

niladi.	into fresh water.
14. Nikel tanga ishlab chiqarishda ham keng qo’llanadi.	Nickel is extensively used in making coins.
15. Nikel po’lat seyflar tayyorlashda ham muhim ahamiyat kasb etadi.	Nickel is also important in making burglar-proof vaults.

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16. Nikel shishaga yashil tus beradi.	Nickel gives glass a greenish color.
17. Nikel boshqa metallar uchun himoya qoplamasi tayyorlashda ham ishlatiladi.	Nickel is used in providing a protecti-ve coat for other metals.
18. U keramikada va Edison rusumli batareyalar tayyorlashda ishlatiladi.	It is used in ceramics and in preparing Edison storage batteries.
19. Tabiiy nikel beshta izotopning ara-lashmasidan iborat.	Natural isotope is a mixture of five stable isotopes.
20. Uning 9 ta boshqa izotopi mavjud.	Its nine other isotopes are known.

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21. Nikel qanday metall?	What kind of metal is nickel?
22. Nikelning kimyoviy belgisi qanday?	What is the chemical sign of nickel?
23. Nikel qaysi mamlakatlarda ko’plab ishlab chiqariladi.	In what countries is nickel mostly produced?
24. Nikel ko’proq nima ishlab chiqish-da qo’llanadi.	In producing what productions is nickel mostly used.

C O N T E N T