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KUZBASS. COAL REGION
(КУЗБАСС. УГОЛЬНЫЙ КРАЙ)

Методические материалы
по дисциплине «Иностранный язык»
(английский язык)

Рекомендовано учебно-методической комиссией направления
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в химической технологии, нефтехимии и биотехнологии
в качестве электронного издания
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KUZBASS. COAL REGION (Кузбасс. Угольный край) : методические материалы по дисциплине «**Иностранный язык» (английский язык)** для обучающихся всех направлений подготовки и специальностей / сост. И. В. Губанова ; Кузбасский государственный технический университет имени Т. Ф. Горбачева. – Кемерово, 2021. – Текст : электронный.

Целью методических указаний является обучение студентов иноязычной лексике, которая может быть использована в сфере профессионального общения. Текстовый материал и система упражнений способствуют активному овладению навыками чтения, расширяют словарный запас студентов. Методические указания рекомендуются для аудиторной и самостоятельной работы по дисциплине «Иностранный язык».

CONTENT

UNIT 1. KEMEROVO REGION

Warming up. How many questions can you answer?

1. How many cities are there in Kemerovo Region?
2. How many cities in Kemerovo Region can you name?
3. What are the main industries in Kemerovo Region?
4. Which city is bigger Kemerovo or Novokuznetsk?
5. Who is the governor of Kemerovo Region?
6. When was Kemerovo Region established?
7. What animals and plants live in Kemerovo Region?
8. What nationalities live in Kemerovo Region?
9. What raw materials is Kemerovo Region rich in?
10. What ancient animal was found in Kemerovo Region?

Task 1.1 Remember the following words

coal – уголь
establish – учреждать, устанавливать
consist of – состоять из
be located – быть расположенным
preserve – сохранять, сберегать
border with – граничить с
urban – городской
reserve – запасать, запас, заповедник
density – плотность
share – доля, часть, разделять
junction – соединение, пересечение
occupy – занимать
be rich in – быть богатым чем-либо
solid – твердый
ground water – подземные воды
environment – окружающая среда

Task 1.2 Read the text and answer the questions

1. When was Kemerovo Region established?
2. How many cities and districts does Kemerovo Region consist of?
3. Where does Kemerovo Region located?
4. What nationalities live in Kemerovo Region?
5. What is the territory of Kemerovo Region?
6. What regions does Kemerovo Region border with?
7. What is the population of Kemerovo Region?
8. Where does the most of the population live?

Kemerovo Region (also known as Kuzbass) is located in the south-east of Western Siberia and it is almost equidistant from the western and eastern borders of the Russian Federation. Geographically Kuzbass occupies a middle position between Moscow and Vladivostok.

In its present borders the region was established on January 26, 1943. The area is 95.5 square kilometers. The territory is located at the junction of the West Siberian Plain and the mountains of Southern Siberia.

Most of the territory is occupied with Kuznetsk basin, the huge coal reserves that gave the second name of the region – "Kuzbass".

Kemerovo Region borders with Tomsk Region on the north-east and north, Krasnoyarsk Territory in the north-east, the Republic of Khakassia in the east, the Republic of Altai in the south, Altai Territory in the south-west, and Novosibirsk Region in the north-west.


Kuznetsky Alatau

The geographical area of Kemerovo Region has a wide variety of landforms that have a certain influence on other elements of the physical and geographical environment.

The largest mountain system in the region is the Kuznetsky Alatau. The western border of Kuznetsk basin is ancient the Salair Ridge. The southern part of Kemerovo Region, Gornaya (Mountain) Shoria, is a territory where the ridges of Northeastern Altai,

Salair Ridge

Kuznetsky Alatau and the Salair Ridge form a complex knot.

Kuzbass has significant mineral deposits and a variety of natural resources.

The population is 2,657,900 people (2020). Most of the population lives in urban areas, there are also large areas with low population density. The share of the urban population amounts to 86.63 % (2018)[1]. Besides Russians, who account for more than 90% of the population, there also live Shor and Teleut small peoples, the indigenous population, and Siberian Tatars, who have preserved their cultural traditions.

The administrative center of the region is the city of Kemerovo with the population of 549,159 people (2015). Administratively Kemerovo Region consists of 20 cities and 18 districts. The largest city in the region is Novokuznetsk.

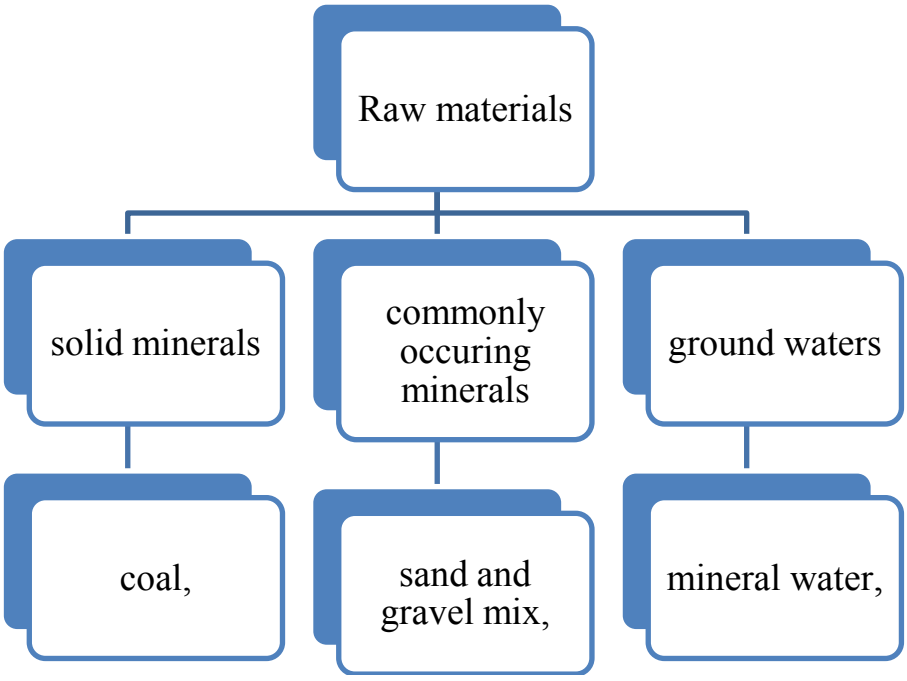
Task 1.3 Revise comparative and superlative adjectives and translate the sentences

1. Новокузнецк – самый большой город Кемеровской области.
2. Городское население Кемеровской области гораздо больше, чем в сельской местности.
3. За последние годы население Кемеровской области стало меньше.
4. Кемеровская область располагается в самой населенной части Западной Сибири.

[1] https://kemerovostat.gks.ru/storage/mediabank/

5. Самое ценное полезное ископаемое Кемеровской области – это каменный уголь.
6. Русские составляют более 90% от населения Кемеровской области.
7. В Кемеровской области больше городов, чем районов.

Task 1.4 Find the information about raw materials Kemerovo Region is rich in and fill in the chart. Speak about mineral deposits of Kemerovo region



Task 1.5 Read the text and find English equivalents

1. разнообразный
2. растение
3. луг
4. пихта
5. осина
6. реликтовый, древний
7. липа
8. хвойные
9. ель
10. лиственница
11. кедр
12. ива
13. тополь
14. лось
15. олень
16. хищник
17. рысь
18. белка


Shor's national park

The vegetation is very diverse. On the mountain tops you can find the plants typical of the tundra and alpine meadows, medium and low mountains are covered with "black forest" – fir-aspen forest with tall grass and relic plants.

The foothills and intermountain basins are covered by steppe (степь) and forest vegetation. There are islets of pine forests, and in Mountain Shoria and the basin of the Kondoma River near Kuzedeevo village there is a relict grove of Siberian linden. There are 87 forestry districts. There are state natural reserve "Kuznetsky Alatau" and "Shor National Park". In general, in Kemerovo Region there are 48.2 % coniferous trees of the main forest species, including pines, spruces, larches and cedars. Softwood plantations are about 51.8%, including birches, aspens, willows, lindens and poplar.

There are large animals like a moose and red deer, a roe (европейский) deer and Siberian reindeer, the latter can be found only in the mountains of the Kuznetsky Alatau. Brown bear, lynx, and wolverine (росомаха) are among the most typical predators. Some animals and birds such as squirrels, muskrats grouse (тетерев, рябчик), hazel grouse, black grouse are of commercial value.

Task 1.6 Find information about any city/village/tourist attractions of Kemerovo region and make a presentation/video project. Use the following tips (you can add any information you need)

1. Name
2. Where is it
3. When was founded /who founded
4. What is it famous for/resources/people/nature etc.
5. What happens nowadays

Task 1.7 Match the words with the pictures

wolverine * grouse * brown bear * squirrel * lynx
linden * aspen * birch * spruce * cedar * deer * moose

a

b

c

e

f

g

h

i

j

k

l

m

UNIT 2. KEMEROVO REGION HISTORY

Warming up. Look at the pictures and label them

1. "Golden Shoria" (Zolotaya Shoriya) Sculpture, Tashtagol
2. Worship Cross, Sheregesh Kurgan mountain
3. Shor National Park
4. Monument to the Memory of Kuzbass Miners, Krasnaya Gorka Kemerovo
5. Monument to Alexander Pushkin, Kemerovo
6. Kuznetsk fortress, Novokuznetsk

Pic.1

Pic.2

Pic.3

Pic.4

Pic.5

Pic.6

Task 2.1 Remember the following words

develop – развивать, разрабатывать	manufacture – производить
plant – завод, фабрика	extract – добывать, извлекать
enterprise – предприятие	refine – очищать
mine – добывать / шахта	coal bed – угольный пласт
capacity – мощность	launch – начинать, запускать
open-pit mine – разрез	implement – выполнять, осуществлять
include – включать	supply – поставлять, снабжать

Task 2.2 Translate the following word chains

metal – metallic – metallurgical, chemistry – chemical – chemist, settle – settlement, occupy – occupation, refine – refinery – refined, develop – development – developer, create – creation, present – represent, transit – transition, cancel – cancellation, supply – supplier – supplement – supplementary – supplementation, include – inclusion – inclusive

Task 2.3 Read the texts and Put the paragraphs into the right historic order

1. After the October Revolution, Kuzbass becomes a part of the West Siberian Territory, and later, a part of Novosibirsk Region.

Post-revolutionary period is characterized by the transition to the planned economy, creation of the Ural-Kuzbass industrial complex,

development of coal, metallurgical and chemical industries of Kuzbass. Kemerovo Coke plant and Kuznetsk Metallurgical Combined Enterprise were built, a lot of new mines were launched. Near the industrial enterprises workers' settlements were built, which quickly became cities: Kiselevsk, Osinniki, Tashtagol, Kaltan, Mezhdurechensk, and others.

2. The current territory of Kemerovo region has been inhabited for several thousand years. In 1618, in the south of the future region Kuznetsk fortress was founded to protect the land from Mongolian and Jungar invaders, in 1698 the city of Mariinsk was founded. Both are the oldest settlements of Kemerovo region.

In 1721 Kuznetsk dowser Mikhaylo Volkov found "Burning mountain" on the banks of the Tom River (burning coal seam), thus becoming a pioneer of Kuznetsk coal.

A notable period of development in the region was at the end of the XVIII century: at that time Kolyvan-Voskresensk plants of A.N. Demidov were built, which later became the property of the Imperial House of the Romanovs, from this moment most of Kuzbass, joined to Altai mining district was owned by the Cabinet of His Imperial Majesty.

During the XIX century the territory of the region was a part of the Tomsk province, forming Kuznetsk and Mariinsk counties. At that time the first industrial enterprises such as Tomsk ironworks, Gavrilovsky and Guriev silver plants, Sukharinsky and Salair mountain mines appeared. The construction of the Trans-Siberian Railway gained an impulse for rapid development of Kuzbass industry.

3. The 1990s completely changed the course of further development, not only in the region, but also in the whole country.

New forms of economy organization appeared in Kuzbass village. They were introduced by the decree of the President of Russia to allow private ownership of land.

However, as a result of privatization and cancellation of the collective farm system the regional economy, as well as the economy of the whole country, went into a deep crisis.

In the 1990s the region's economy went into decline, but by the end of the decade there were positive developments, and first of all, the development of the coal industry. More effective and safe open-pit coal mining technology was developed. Only in 1999, 15 coal enterprises were launched. During the last two decades 11 new mines and 16 open-pit mines have been put into operation.

Since 2001 OJSC "Gazprom" has been implementing a pilot program "Experimental-Industrial Extraction of Methane from Coal Beds of Kuznetsk Basin."

Another new industry for the Kemerovo region is oil refining: development of oil refineries started in 2003.

In February 2010, Coal and Gas extraction enterprise for production and use of methane from coal beds was officially launched.

4. There a number of sites of ancient ages on the territory of the region. Mokhovo 2 in Kuznetsk Basin is a site of the Middle Paleolithic Age. Shumikha-I, Bedarevo I, II, II, Shorokhovo-I, Ilinka-II, Sarbala, Voronino-Yaya, the settlement on the river Kiya, near the village of Shestakovo are all sites dated by the late Paleolithic Age. Big Berchikul-1, Bychka-I, Pechergol-1 are the sites of the Mesolithic Age. Berchikul-4, Smirnovsky creek-1, Pechergol-2, Bychka-1 (late layer), Tomskaya Pisanitsa are the sites of the Neolithic Age. Bronze and Iron Ages are represented by the settlements of Samus, Andronovo, Korchazhkino, "andronoid" Elovo, Irmen, Bolsherechye, Tagar, Kulay, and Tashtyk cultures.

5. During the Great Patriotic War, Kemerovo region became a major supplier of coal and metal. More than 50,000 tanks and 45,000 aircrafts were made out of Novokuznetsk steel. Equipment of 71 enterprises was evacuated to Kuzbass from the occupied areas, most of these enterprises have remained in Kuzbass. Thus, the war doubled the industrial capacity of Kuzbass.

In 1943, the Presidium of the USSR Supreme Soviet decreed on January 26 to separate Kuzbass from Novosibirsk Region and establish on its territory Kemerovo Region with the administrative center in the city of Kemerovo. The new area included 17.5% of the

territory of Novosibirsk Region, 9 of the 12 cities of regional subordination, 17 of the 20 workers' settlements, 23 out of 75 districts. The population of Kemerovo Region was 42% of the total population of Novosibirsk Region.

During the rapid growth of the region in the post-war new Kuzbass cities Polysaevo, Mezhdurechensk, Osinniki, Taiga and others appeared.

Task 2.4 Answer the following questions to the text

1. What ancient sites are there in Kemerovo region?
2. When was Kuznetsk fortress founded and why?
3. What oldest settlements of Kemerovo region?
4. Why was the end of the XVIII century a notable period of development in the region?
5. When did the first industrial enterprises in Kemerovo region appear?
6. What helped them rapidly develop?
7. How did Kemerovo region contribute to the Victory in the Great Patriotic War?
8. How many enterprises were evacuated to Kemerovo region at the war time?
9. When did Kemerovo region appear?
10. How many cities and settlements were in Kemerovo region at first?
11. Which cities appeared in post-war period?
12. What happened in the region in the 1990s?
13. What program started in 2001?
14. What new industry started in 2003?

Task 2.5 Scan the text and fill in the chart. What happened in those years

year	***event***
1701	"Sheglovo" was marked on the map
1721	

1. A lot of cities have century-long history. 90 years of existence is not a long period but namely in this short period of time a modern city, an administrative center of Kuzbass, a big industrial and cultural center appeared instead of Sheglovsk, an unknown settlement.

It was a small village, there weren't any kindergartens, preschools, cultural centers. There was only one church parochial (приходская) school, and as a result every second person was illiterate.

In 1701 the plot "Sheglovo" situated in the area where unnamed river (later the Iskitimka river) flowed into the Tom was marked on the map "Tomsk city territory" in the geographic atlas of Siberia made by Semen Ustinovitch Remizov who was a historian and geographer from Tobolsk. In 1721 Mihailo Volkov – Russian Cossack and expert in ore – found 3-sagene (сажень – единица измерения длины) coal-bed sailing up-stream the river Tom at 120 line from Tomsk. He sent samples of this coal to Moscow berg-collegium. This is the story how Kuznetsk "Fire stone" was discovered.

2. Although the location of coal fields near the river Tom was very favorable and didn`t require either many efforts or much funding, it took the Imperial government 200 years to start the extraction of Kuznetsk coal. The construction of roads was unnecessary as the river Tom allowed to transport the coal to the territories along such rivers as the Ob and the Irtysh up to the Ural river, where the demand for coal was very high. Namely here on the right bank of the river Tom in the area of small village Sheglovo and on the left in the territory of Kemerovo the first pits were opened.

Here in these pits the first Bolshevik societies were organized. On November, 24 in 1917 Soviet Working Deputy Council of Kemerovo pit and coke-chemical plant gained control over this territory. Then it became obvious that old bourgeois Kuznetsk, situated hundreds kilometers away from Kemerovo and Kolchuginsk pits and densely populated rural area had no possibility to change life in Kuzbass for the better.

3. On March, 30 in 1918 Tomsk Province Executive Committee enacted to form a new uyezd called Sheglov. It was formed from the village Sheglovo which was situated in Verkhotomskaya volost.

There was an increase in the extraction of coal in Kuzbass in 1921. It allowed the region to become the leading coke chemical industrial center within 5 years time. In summer in 1921 the initiative group of American workers headed by a Holland engineer and communist S. Rutgers and an American communist B. Heighwood offered the soviet government to found a colony of foreign workers and specialists in Kuzbass. S. Rutgers, T. Barker, B. Heighwood, G. Kalvert and B. Cornblit left for Kuzbass on June, 28 in 1921.

4. The colonists contributed to the economic life development a young town being inspired by the thought of implementing their international duty.

In autumn 1924 Kuznetsk and Sheglovsk uyezds were separated from Tomsk province and transformed into Kuznetsk okrug and Sheglovsk became its administrative center.

Industrial growth stimulated the town development. In June 1930 a drawn project of the new lay-out of Sheglovsk was viewed and analysied by the town council. According to it the town was supposed to provide 130 000 citizens with comfortable living conditions. During the discussion the question about the name of the town arose. Citizens took active part in this discussion. They agreed unanimously, that the name of a former trade village Sheglovo wasn't connected with the history of the town founded for coal mining. It was decided to apply to the Presidium of West-Siberian Regional Executive Committee so that Sheglovsk would be given a new name – Kemerovo. On March, 27th 1932 the Presidium of All-Union Central Executive Committee decreed to rename Sheglovsk.

5. During the World War II hundreds of people from Kemerovo put on soldier's greatcoats and went to battle-fronts to fight.

On January, 26 in 1943 according to the decree of the Presidium of the Supreme Soviet of the USSR Kuzbass industrial area was turned into a region. Kemerovo became the administrative center of Kemerovo region. At that time all buildings in Kemerovo were

wooden and one-storey, the streets were dirty with swampy wastelands. The houses (mostly barracks) were situated only on the left bank of the river near the coke-chemical plant. Several brick buildings were near the river Tom, 8 four-storey schools, the cultural center "Trud", the cinema "Moskva" were the only sights of the town.

6. Before the War Kemerovo used to be built without a general plan, although the first attempts to work it out were made in the 1930s. In the period from 1947 to 1951 the general plan of the development of the town up to 1960s was worked out. According to this plan the town was supposed to develop quickly and its part situated on the other bank of the Iskitim river in particular. In 70s and 80s the construction of the town continued. On April, 27 in 1979 the new microdistrict "Shalgotaryan" was set up in Lenin district. It had unusual modern lay-out. High-rise buildings were tiled. Trade and service shops were constructed in the passages of blocks of flats. A lot of blocks of flats and social and cultural centers are being built now in Kemerovo. The temples of the orthodox eparchy that have recently been built in Kemerovo are unique and have no analogues in Siberia.

Nowadays Kemerovo is one the biggest industrial centers situated in the eastern part of Russia. It is the city of power engineering, mechanical engineering and chemical industry.

There is an old saying – "every city has its customs". Kemerovo is not an exception. It has its own history and problems. The story of this city hasn`t been completed yet.

Task 2.6 Find information about the history of your own city/village or any city of Kemerovo region and make a presentation/video. Use the following tips (you can add any information you need)

1. Name
2. Where is it
3. When was founded /who founded
4. What is it famous for/resources/people/nature etc.
5. What happens nowadays

UNIT 3. KUZBASS COAL

Task 3.1 Remember the following words

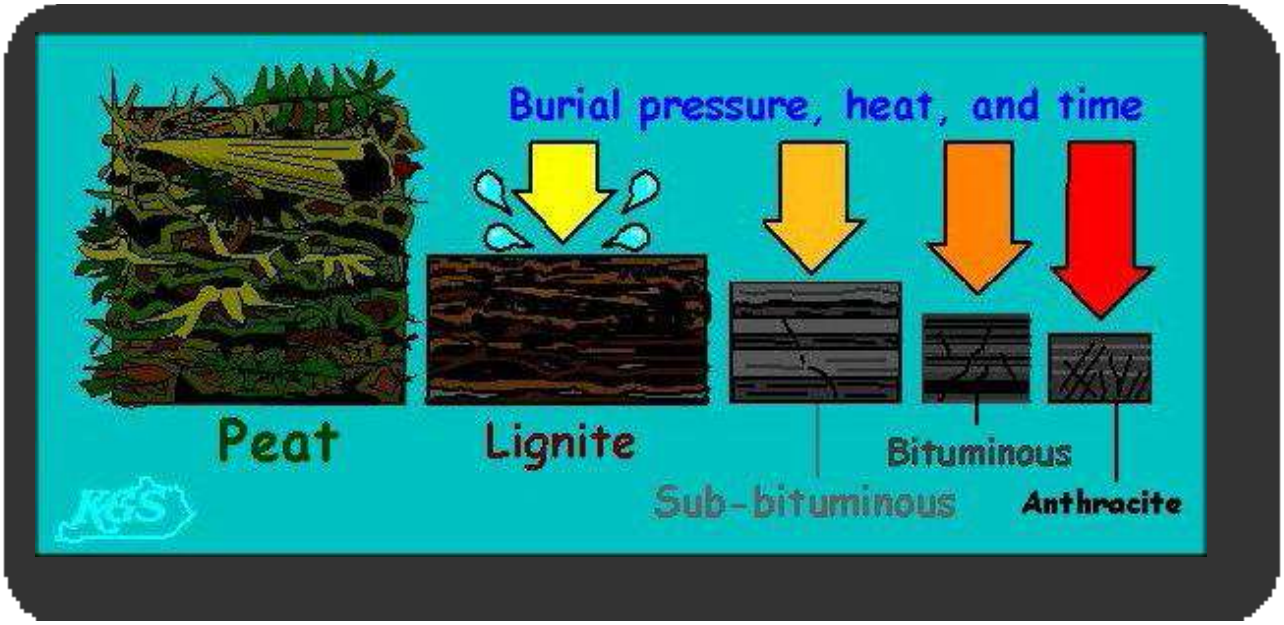
fossil – ископаемое, окаменелое
application – применение
ash – зола, пепел
pressure – давление
value – ценить, ценность
contain – содержать
peat – торф
deposit – месторождение
moisture – влажность

coking coals – коксующиеся угли
anthracite ['ænθrəsaɪt] –антрацит
lignite ['lɪgnaɪt] – бурый уголь, лигнит
melting temperature – температура плавления
coal basin – угольный бассейн
impurity – примесь, загрязнение
heat value – теплота сгорания
property – свойство

Task 3.2 Translate the words with the same root

fossil – fossilized, export – exporter – exportable – exportation, contain – container – content, vary – variety – variant – various, apply – application – applied, contain – container, melt – melting, pure – purity – purification – impure – impurity, apply – application, generate – generation – generator, value – valuable, press – pressure – pressing, heat – heating – heater

Task 3.3 Look at the picture below and answer the question about coal formation



1. What is coal formed of?
2. What conditions are necessary for coal formation?
3. Which coal is the youngest?
4. Which coal is the oldest?
5. Which coal do you think is the best?
6. What coal can be used for?

Task 3.4 Read the text and find English equivalents to the words below. Find sentences with modal verbs and translate them in writing

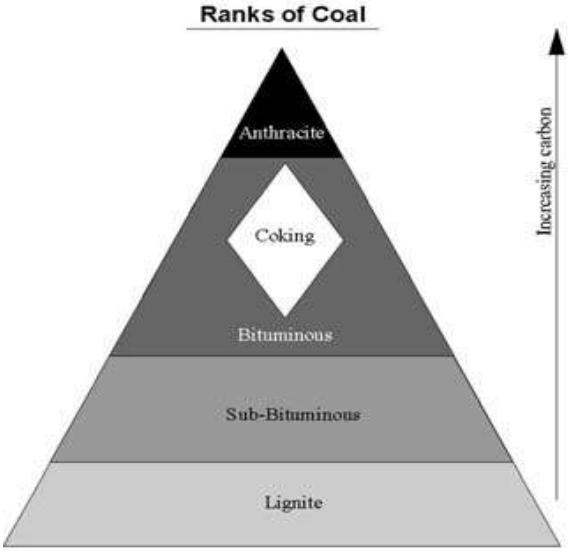
1. окаменевший	6. категория, класс
2. теплотворная способность	7. производство электроэнергии
	8. природное преимущество
3. температура плавления	9. смола
4. примеси	10. бетон
5. механическая прочность	11. битуминозный, жирный уголь

Types of Coal

1. We use the term "coal" to describe a variety of fossilized plant materials, but no two coals are exactly alike. Heating value, ash

melting temperature, sulfur and other impurities, mechanical strength, and many other chemical and physical properties must be considered when matching specific coals to a particular application.

Coal is classified into four general categories, or "ranks". They range from lignite through sub bituminous and bituminous to anthracite, reflecting the progressive response of individual deposits of coal to increasing heat and pressure. The carbon content of coal supplies most of its heating value. The amount of energy in coal is expressed in British Thermal Units per pound. A BTU is the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit.



Lignite ranks the lowest and is the youngest of the coals. Anthracite is coal with the highest carbon content, between 86 and 98 percent, and a heat value of nearly 15,000 BTUs-per-pound.

Bituminous coal is used primarily to generate electricity and make coke for the steel industry.

Ranking below bituminous is sub-bituminous coal with 35–45 percent carbon content and a heat value between 8,300 and 13,000 BTUs. Although its heat value is lower, this coal generally has a lower sulfur content than other types, which makes it attractive for use because it is cleaner burning.

Lignite is a geologically young coal which has the lowest carbon content, 25–35 percent, and a heat value ranging between 4,000 and 8,300 BTUs-per-pound. Sometimes called brown coal, it is mainly used for electric power generation.

In 2012, the Kusbass mines and open-pit mines (разрез) produced all together about 201.5 mega tons of different types of coal (about 4.8% more than in 2011), about 102 mega tons of which were exported by sea.

2. Coal is the main mineral resource of Kuzbass (one of the largest coal basins in Russia and the main, if not the only, supplier of process raw material to the Russian industries). Its territory comprises the Kuznetsk black coal basin and the western part of the Kansk-Achinsk brown coal basin.

The conditioned reserves of black coal in Kuzbass exceed the total world's reserves of oil and natural gas by more than 7 times (when converted into equivalent coal) and reach almost 700 billion tons, of which over 200 billion tons account for coking coals (coking coals reserves in Donbass – 25 billion tons; in the Pechora coal basin – 9 billion tons; in Karaganda – 13 billion tons).

Today, the reserves of coking coals in Kuzbass account for 73% of the total reserves of these types of coal in the developed coal basins of Russia, and over 80% of Russia's coking coals are mined in Kuzbass.

Non-coking steam coals account for 70% of the total coal reserves in Kuzbass. The rest of the black coals are unique as they have an ability to cake (спекаться, затвердевать) and therefore can be used as both power-generating and by-product-coking material, depending on the way of their preparation.

Kuzbass coals are of unique quality. They come in almost all process grades and groups from brown coals to anthracites. Their main natural advantage over the coals from other basins of the world, however, is that they combine such qualitative indicators as high calorific value (6250 kcal/kg), low sulfur content (0.4–0.6%), low moisture (7.8–10%) and medium ash (15.3–23.2%). These indicators are much better than the average ones in the Russian coal industry. Special attention should be given to such unique coals of Kuzbass as sapro-mixites from the Barzas coal basin. They have a high percentage of low-phenol resin (up to 38%) and are a valuable chemical material for producing petrol products and asphalt concrete.

Coal is the main, but not the only mineral resource in Kuznetsk land. The mineral resources of Kuzbass are unique in terms of their variety, quantity, and quality. In this respect, the region can only compare to Urals.

Task 3.5 Answer the following questions to the text

1. What is coal?
2. How many ranks of coal were mentioned? What are they?
3. Which coal has the lowest rank?
4. Which coal has the highest carbon content?
5. Which coal is sometimes called brown coal?
6. How big are reserves of black coal in Kuzbass?
7. How much of Russia's coking coals are mined in Kuzbass?
8. What is the main feature of sapro-mixites from the Barzas coal basin?
9. Why are Kuzbass coals unique?

Task 3.6 Fill in the chart and speak about types of coal and their usage

rank of coal	**used for**

Task 3.7 Read the text and find English equivalents to the following Russian words

1. месторождение
2. подножие
3. железная руда
4. слой, пласт
5. берег реки
6. промышленность
7. угольный бассейн
8. исследователь
9. медь
10. серебро
11. место
12. составить карту
13. предприятие
14. проблема

The Discovery of Coal in Kuzbass

At the beginning of the 18th century Peter the First ordered to V. Gennin, the chief of the Urals and Siberian enterprises, "to find coal, as is done in other European countries".

Mikhailo Volkov's name appeared for the first time when rich silver and copper deposits were found at the foot of the Altai Mountains by a group headed by Kostylev in 1721.

By February 1722 M. Volkov had made his own claim – "Iron ore, found in the Tomsk region, is the coal".

The coal layer was found in the "burning hill" seven verst from the Verkhotomsk Fortress, in a rip of the steep right bank of the river Tom. This place is in Kemerovo opposite the old bridge connecting both banks of the river.

There is a monument devoted to the first explorer in the central part of Kemerovo.

The discovery didn't have any practical use at that time. There was no possibility to transport the coal to the Urals, and Siberia and Kuzbass in particular had no metallurgical industry at that time. The ore seeker Mikhailo Volkov was sent to the Podvolshny ore deposit in the Urals and lost out of history sight. But his discovery was very important for Kuzbass.

A hundred years later, when Kuzbass had established several of its own metallurgical enterprises, the region faced with the same fuel problem, as the nearby forests were burnt out and the question of coal became an issue again. Several layers of coal that showed out of the Tom river bank near Shcheglovo, the villages Atamanovo and Borisovo above Kuznetsk and on the river Inya were explored. It became clear, that the different deposits were part of a huge coalfield. The engineer-capitan Sokolovsky wrote in 1842, that this area embraced the basin between the Salair and the Kuznetsk Alatau and had a total area of 40 thousand square verst.

Peter Aleksandrovich Chikhachev, a known Russian geographer, arrived to the area in 1808. He summarized the information concerning the Kuznetsk coal starting from the banks of the Kondoma and Mrassu rivers in the south and ending at the banks of the Inya River in the north. The prominent scientist was astonished by the amount of "burning material" hidden in this land. As a result he was the first who mapped of the basin. He was also the first man who suggested the name "Kuznetsk coal basin" (Kuzbass). "I call this region Kuznetsk Basin in honor of a town located in its southern part", wrote the scientist.

Task 3.8 Answer the following questions to the text

1. When was coal found in Kemerovo region?
2. Who discovered coal?
3. How big was the coal basin?
4. Who was Peter Aleksandrovich Chikhachev?
5. How did he contribute to Kemerovo region?

Task 3.9 Find information about famous people of Kemerovo region and make up a presentation

UNIT 4. KUZBASS INDUSTRY



Task 4.1 Remember the following words

quarry – разрез
manufacture – производить
wholesale – оптовая торговля
repair – чинить, ремонтировать
meet demands – удовлетворять требовании

retail – розничная торговля
vehicle – транспортное средство
household – домовладение
construct – строить
share – доля, часть
volume – объем
trade – торговля
enterprise – предприятие
fertilizer – удобрение

Task 4.2 Translate the words with the same root

safe – unsafe – safety, economy – economic, mine – mining – miner, act – activity – actor, ferrous – non-ferrous, construct – construction – constructor, grow – growth, invest – investment –investor, produce – producer – production, extract – extraction, develop – developing – development, industry – industrial, value – valuable

Task 4.3 Read the text and find English equivalents to the following Russian words and word-combinations

1. создание
2. переработка
3. добыча
4. промышленная безопасность
5. компьютерная обработка данных
6. выполнение, осуществление
7. геологоразведка
8. вредные отходы
9. экологический контроль
10. обогатительная фабрика
11. место, позиция
12. профилактические меры
13. токсичные отходы
14. выставочный комплекс
15. разработка
16. предприятие
17. высокоэффективный
18. марганец
19. золото
20. серебро
21. цинк
22. медь
23. редкий элемент
24. мощный, сильный
25. ценный

1. Kuzbass nowadays is one of the most perspective and dynamically developing regions of Russia. Having developed transport infrastructure, powerful multi-branch economy it plays the leading role in Siberia.

Kuzbass is extraordinary rich in mineral resources. Resources of coal are about 700 bln tons, which is the most important for the economy of the region. There are also deposits of gold, silver, manganese, zinc, lead, copper and other rare elements. So Kuzbass has got the largest raw potential determining the specific economic development of the region.

Nowadays the share of the region is 61% coal mined in Russia (85% is the most valuable coking coals), more than 13% produced pig-iron and steel, 23% sorted rolled steel, 11% aluminum and 19% coke. Lately there is rapid growth of investments into economy of Kuzbass including foreign investments (annually over 50 rubles are invested), production is modernized, new enterprises start their activity.

2. The base of the regional economy is coal mining. The coal meets the demands of Russia and is exported to many countries. Kuzbass accounts for 70% of Russian coal exports. Thanks to the region, Russia ranks third by energy coal supplies (after Australia and Indonesia). Now a new type of coal mining branch is being created in Kuzbass. Coal mining companies are aimed at using high technologies, making miners' work safe.

For the latest 7 years more than 1.7 bln Euro has been invested to the coal industry of Kuzbass. 27 new modern coal mining enterprises were opened. The industrial safety problem there is solved due to high mechanization and automation. So, the future of coal mining industry in Kuzbass is high-efficient production.

3. The second leading industry in Kuzbass – metallurgy (ferrous and non-ferrous) – is also upgrading. Its share is 38% of the total

volume of industrial products of the region. Products of just one of our metallurgical plants are exported to 30 countries.

Chemical industrial complex of Kemerovo region is one of the largest in Russian Federation. Kemerovo region exports 1200 kinds of industrial products (coal, coke, rolled steel, pig-iron, aluminum, zinc, ferroalloys, nitrogen fertilizers, machines for heavy industry) to 80 countries.

Mechanical engineering is one of the most rapidly developing industries of Kuzbass. It unites 97 companies – manufacturers of mining, electric-mechanical, road-building equipment, equipment for gas industry, chemical, light and food industry.

4. The region supplies accounts for all tram rails in Russia. Train rails manufactured in Kuzbass are believed to have the highest quality in the history of domestic railway transport. Chemical, machine-building, and oil refining industries are developing in the region as well.

Industrial and housing construction is developing in rapid tempos. Great attention is paid to the agricultural complex development. The greatest attention in the region is paid to a small business in the leading industries as well as in construction, trade, tourism, etc.

Development of tourism is promising. Kuzbass has got unique nature: wild taiga, mountains, clean rivers and lakes. Gornaya Shoria is "Siberian Switzerland". Here is the complex for tourism and alpine skiing meeting all European standards.[2]

The region has set a difficult but achievable task to develop its industry without affecting the environment and quality of life of its residents. The first environmental standard has been developed for in the country. All manufacturing enterprises in Russia now have to adopt it.

5. There is a set of business support measures in the region. Four cities – Novokuznetsk, Yurga, Anzhero-Sudzhensk and Prokopyevsk – have the status of advanced development territories: entrepreneurs and investors are provided with unprecedented support there.

[2] http://www.kemobl.ru/Ekonomik/prom.asp?n=1

Large-scale federal projects have been implemented in Kuzbass. On September 1, 2019, the Presidential Cadet School was opened in Kemerovo. The region has also children's technology park and Sirius-Kuzbass "Quantorium-42" (a regional center for gifted children). Large-scale school renovation is underway in the region.

Kuzbass is one of Russia's top five world-class scientific and educational centers regions. They were built in the region to develop innovative coal mining and processing technologies and leading projects in ecology and medicine.

Task 4.4 Answer to the question to the text

1. What are the leading industries in Kuzbass?
2. Which is the base industry in the region?
3. Which industries are developing in the region?
4. What does chemical industrial complex export?
5. What is special about train rails produced in Kuzbass?
6. Why is development of tourism in Kuzbass promising?
7. What difficult but achievable task has the region set?
8. Which cities in Kuzbass have the status of advanced development territories?
9. What large-scale federal projects have been implemented in kuzbass?

Task 4.5 Read the text and find more information about current Technopark activities and innovations. Make a presentation

Creation of a high-tech Technopark on the territory of the Kemerovo region

The concept of a high-tech Technopark in Kemerovo regionhas been worked out. Taking into consideration the specialization of the region, the main technopark objectives will be as follows:

- coal and coal waste processing;
- development of new coal mining technologies at;
- coal mine methane extraction and processing;
- industrial safety;

- development of new mining machine building technologies;
- creation of dispersed data-computing complexes, etc.

PLANNED PRODUCTION:

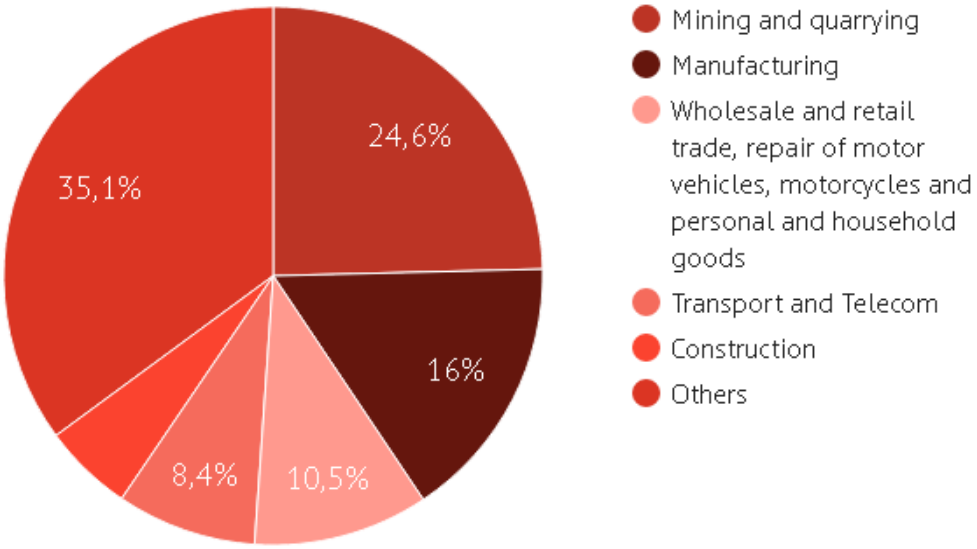
Implementation of complex projects (technological and technical design, business plan) at the consumer companies:

- underground coal gasification energy complexes
- methane extraction and processing complexes
- machines and equipment for coal extraction
- geologic exploration and geophysics of coal seams
- rare metal extraction from coal wastes complexes
- coal processing complexes
- effective mine safety tools
- technological process monitoring
- hazardous wastes processing plants
- environmental monitoring complexes in Kuzbass
- equipment for implementation of preventive measures.

The Technopark will be located at several sites including a public business center, laboratory and production buildings experimental plants, an exhibition complex, as well as objects of social, sports and entertaining infrastructure. The main office of the Technopark will be situated in Kemerovo.

Task 4.6 Write a short summary to the text. Give the main idea and at least two examples to prove it. Add some information which is also important

Task 4.7 Study diagram and speak about regional industry. Which is the major one? Which are quite well developed? What goods are produced in Kuzbass?



[3]

UNIT 5. KUZBASS ENTERPRISES

Task 5.1 Remember the following words

merchant – коммерческий
fat – жирный
fiery coal – газовый уголь
load – загружать
coal-preparatory shop – углеподготовительный цех
char tower – угольная башня
coal-tar pitch – каменноугольная

[3] https://hcsds.ru/en/holding/actives/

clinker – шлак	смола; пек
rag – дробить	foundry coke – литейный кокс
coking box – камера коксования	strippant – удаляемое вещество; десорбат
joint-stock company – акционерное общество	crude benzol – неочищенный (сырой) бензол)
flow diagram – структурная схема	raw material – сырье, необработанный материал
by-product – побочный продукт	management company – управляющая компания
tarry matter – смолистое вещество	cokery heating – нагревание в коксовой печи
removal – выемка, удаление	aggravation – ухудшение, обострение

Task 5.2 Translate the words with the same root

rag – ragging, blend – blending, region – regional, coke – cookery, load – loading, locate – location, develop – development, produce – production – producer, region – regional, coke – cookery, prepare – preparation, recover – recovery

***Task 5.3 Read the text and make a list of the main stages with dates in the history of* JSC "Koks"**

History of JSC "Koks"

1. History of the plant is remarkable and sometimes complicated. The most important periods of scientific and technical development for Kemerovo by-product coke plant were in 1930–1943 and 1971–1980 when significant technological re-equipment and reconstruction were carried out. It helped the plant remain one of the leading plants in the industry.

Intensive industrial development of Kemerovo in the 60–80s of the last century had led to significant aggravation of ecological situation. A decision to stop some production sections and plants was made. It was supposed to carry out a re-profiling of Kemerovo by-product coke plant as well.

However the staff managed to cope with that complicated situation and save the plant. They worked out and consequently put into practice an ecological improvement strategy of technological processes.

At the late 80s and early 90s a coke-oven tar pitch shop and separate units of coking production were put out of production. Organizational and engineering measures ensuring significant reduction of harmful environmental effects were developed and introduced in the operating capacities.

2. In 1995–1996 coke-oven battery № 4 was relined. The hot repair of oven fund using technologies of German companies "Holter", "Fosbel" and "Lichtenberg" is being constantly renovated. The most significant event starting a new period in the development of JSC "Koks" was coke-oven battery № 6 commissioning in May 2001. The new aggregate is remarkable for a complex use of all modern engineering decisions aimed at enhancing performance, reducing gas and dust emissions, improving working conditions, expanding automation of production process. The collective striving to expand production is backed by the local authorities. The construction of battery №6 has been carried out under his auspices, and the program of the plant modernization is connected with the task of expansion of processing industrial infrastructures in the region.

3. At the same time technical renovations of chemical shops was carried. The main achievement was cooperation with VUKHIN, construction and commissioning of the installation for ammonia removal from coke-oven gas using the circular phosphate process in 2000. Putting this equipment into operation enabled to avoid using in production large quantities of sulfuric acid and eliminate production

of ammonium sulphate which was used as fertilizer and caused serious problems. At the same time emissions were reduced, additional source of steam was obtained.

Microprocessor engineering has completely allowed computerize this installation. Such technique has been applied for the first time in Russia. In the shop of catching №2 a new installation for treatment of waste waters is being tested. The technology of waste water treatment allows getting water of such quality that makes possible its further use in production without any limitation. Strict technological discipline, introduction of computerized control systems, ecological training of personnel ensures a constant reduction of pollutant emissions. Thus, over a period from 1997 to 2002 specific atmosphere is emissions have decreased from 3,87 kg to 3,0 kg per ton of coke.

Task 5.4 Find in the text English equivalents to the following Russian words

1. сложный	7. установка, сборка
2. побочный продукт	8. обработка
3. ухудшение, усугубление	9. сточные воды
4. улучшение экологии	10. гарантировать, обеспечивать
5. улучшение работы	11. выбросы, загрязнения
6. удаление	12. уменьшаться

Task 5.5 Read the text and summarize its main points

The treated effluents of the plant are in a closed technological process. The regularity of partnership relations helps to envisage more

clearly and precisely an economic perspective. "Koks" tends to surround itself by long-term and reliable partners, first of all coal feed stock suppliers. A few years ago the JSC "Koks" invested funds in financial recovery of coal treatment factory in Beryozovsky situated 50 kilometers from Kemerovo. Coals from various Kuzbass mines run a preliminary preparation there and goes by regular routes to the plant site. Coke is used as a fuel in metal processing. Strong economic links with its makers are of great importance. For a number of years such partnership relations exist with the joint-stock company «Tulachermet» known in the European markets as a major supplier of quality pig-iron. It is a leading Russian exporter of pig-iron. Up to 120 thousand tons of coke are monthly delivered from Kemerovo to Tula to give birth in blast furnaces to the famous Tula metal. To strengthen ties with coal producers "Koks" invested funds in the factory expansion for rock-dust production in the city of Guryevsk. Its product helps to ensure safe labor of the miners.

For its 80-year's history the plant was rebuilt several times updating its production facilities. Development of technology facilitated growth of experience and knowledge of the plant specialists about coking properties and abilities of the Kuzbass coals, as well as recovery from them various chemical by-products. This knowledge allows today the joint-stock company to confidently operate in the raw market.

Nowadays the productive capacities performance of the joint-stock company amounts to 2850 thousand tons of coke annually. Four basic technological shops constitute the plant are: coal preparation shop, coking shop and two shops for recovery of coke chemical by-products.

Their operation is ensured by maintenance and service divisions: steam shop, specialized shops for repair of the coke-chemical equipment №1 and №2, electrical shop, a shop of metrology and

automation, motor transportation shop, mechanical repair shop, central plant and eco-analytic laboratory.

Task 5.6 Read the text and fill in the chart

place	*processes*
the coal preparation shop	
the coking shop	
the shops of the recovery	

Plant flow diagram

The first technological unit in coke industry is coal-preparatory shop. Here one gets working mixture for coking from coal concentrate of different sorts (coking, fiery and fat coals) by their ragging and blending in a particular proportion. Due to the conveyance system working mixture is driven to cokery char towers, where by the means of the loading machine it is moved through a cokery in accordance with a technological diagram and is loaded into the oven through the upper manhole (смотровое отверстие).

In coking boxes working mixture is heated till 1100–1150 degrees without access of air and transforms into plastic stage (it clinkers). At that all concurrent substances (hydrogen, ammonia, tarry matters and benzene hydrocarbons) are removed from coal mixture and almost solid carbon is left. The optimum time of coke production (coking period) – 14–14,5 hours. Since the starting moment and during all the period of exploitation (20–25 years) cookeries (продукция) are constantly in accordance with clinker size divided into several fractions (+60 mm, +40 mm, 25–40 mm, 0–10 mm fractions etc.), then it is loaded into carriages and delivered to the customers.

coke battery

coke oven battery at night

coke charging processing tower

During the coking process coke-oven gas escapes, it sequentially passes cooling, purification and useful substances collecting stages – particularly, coal-tar pitch and crude benzol. Stripped gas is partly returned to the technology for cokery heating, and its excess is driven to the electric power plant (Kemerovskaya HEPS), where it is used as a fuel for gas production and electrical energy.

Shops: the coal preparation, the coking shop, the shops of the recovery.

Task 5.7 Read the text and make the chart of the process for producing high grade needle-shaped cokes below

stage	what happens

New Automated Covered Coal Warehouse Commissioned at OAO "KOKS"

This invention relates to production of high grade cokes for use in graphite electrodes, etc. More particularly, it is concerned with a simple, but very effective method for obtaining cokes from hydrocarbon compounds having large molecular weight or mixture of hydrocarbon compounds containing such large molecular weight hydrocarbons such as crude petroleum oil, distilled residue oils, ethylene cracker bottom oil, various pyrolytic tars and pitches, coal tar, coal pitch, and so on.

High grade cokes are produced by a simple expedient such that crude oil is charged into a coking drum and subjected there into a two step operation, reforming the oil and subsequent coking under bubbling into the oil of a heated non-oxidizing gas. No fluidized bed of the oil to be coked is formed.[4]

A process for producing high grade needle-shaped cokes which comprises:

A. charging a raw material oil selected from the group consisting of (a) residual oils (остаточные масла) resulting from distillation or solvent extraction of petroleum to separate light fractions, (b) heavy tars and pitches resulting from pyrolysis of petroleum oils, (c) heavy tars and pitches of b which have been subjected to thermal reforming, (d) coal tars and coal pitches and (e) mixtures of such raw materials which melt at a temperature below 250 coking drum,

B. reforming the charged raw material oil in the coking drum by heating said oil as a liquid pool at a temperature of from 300 400 to 10 hours,

C. coking the liquid pool reformed raw material oil by heating said oil in the coking drum at a temperature of from 400 a pressure higher than atmospheric pressure while blowing a non-oxidizing gas selected from the group consisting of vaporized hydrocarbon oil, hydrogen, nitrogen and steam heated at a temperature higher than that of the reformed raw material oil by at most 300 the coking drum and through said liquid pool at a flow rate of from 5 to 50 millimeters / second,

4 http://www.google.com/patents/US3956101

calculated on the basis of the flow velocity of the gas through the empty coking drum, until coking of the reformed raw material oil has been substantially completed, thereby simultaneously heating and agitating the reformed raw material oil within the coking drum to secure uniform heating of the reformed raw material oil, removal of excess heat generated in the coking drum and promotion of crystal orientation of the coke to be produced.

D. decoking the product thus produced, the entire process being carried out in the absence of, and without formation of, a fluidized bed.

The advantage of the present invention over the above-mentioned known method is that the heating of the raw material is carried out in the coking drum, which not only avoids clogging of the coking apparatus, but also permits establishment of optimum conditions for improved quality of the produced cokes, particularly the coking temperature range and relationship between the heating speed and heating time, which conditions cannot be realized by the known method such as "delayed coking method." These conditions are indispensable in manufacturing needle-shaped cokes of good quality.

As stated in the foregoing, the coking method according to the present invention readily solves the difficult problems in the course of heating the raw material by a very simple operation of gas blowing. Furthermore, by controlling the flow rate of the blowing gas current along with the coking temperature and pressure, it is possible to obtain cokes of excellent quality, while maintaining the optimum conditions for every kind of the raw materials throughout the coking operation.

Task 5.8 Find English equivalents in the text to the following Russian words and word-combinations

1. метод коксования
2. качество производимого кокса
3. диапазон температур коксования
4. необработанное сырье
5. скорость потока газа
6. отделить легкие фракции
7. высококачественный кокс
8. размером с иголку
9. нагревание сырья
10. проводить в барабане коксования

Task 5.9 Read the text and summarize its main points

SBU Azot is one of the largest producers of nitrogen fertilizers in Russia. The Company's plants manufacture nitrogen products for industrial and agricultural clients, and petrochemicals. The Company is a key player on the domestic nitrogen market and sells its products in over 40 countries worldwide.

The Company's production and service assets are located in Western and Eastern Siberia and include Kemerovo Azot, Angarsk Nitrogen Fertilizer Plant and AZOT-Service.

On the regional market (Siberia and the Far East of Russia, Mongolia and Kazakhstan) the Company's primary product for sale is ammonium nitrate, which is widely used to make explosives for mining companies, its key consumers.

Since 27 December, 2011 Joint Stock Holding Company "Siberian Business Union" owns 100% of the Company's shares. SDS manages diversified assets across various industries, including one of the leading coal mining companies in Russia (SDS Coal).

JSC Azot was established resulting from the Novokemerovo Chemical Complex's reincorporation as an open joint-stock company in 1993. Today, Kemerovo JSC Azot is a vertically integrated complex of production units and a number of marketing, financial and transport entities to assist them. The Company is a major enterprise of the Russian chemical complex principally engaged in the production of ammonia, nitrogen fertilizers, and caprolactam. Kemerovo JSC Azot is among the Top 10 largest producers in the domestic nitrogen and nitrogen compound making industry and is firmly placed as the second largest producer of caprolactam in Russia (in particular, it

accounts for more than 33% of the caprolactam and over 9.6% of the nitrogen fertilizers produced in Russia).[5]

Task 5.11 Find information about any Kuzbass enterprise and make a presentation. Use the following plan

1. Name and location
2. When it was opened
3. Production
4. How ecologically friendly is it

APPENDIX

[5] http://www.akmrating.ru/en/company/index/61

ADDITIONAL TASKS

Task 1. Translate into Russian

1. When the coking reaction is carried out with such aliphatic hydrocarbon component being present in the raw material, a three dimensional structure tends to be formed due to cross-linking action by such aliphatic chains, which obstructs the crystal growth in the resulting cokes.
2. The raw material thus reformed is then subjected to coking in the very same coking drum (or a coker) at a coking temperature, during which a non-oxidizing gas heated to a temperature higher than the temperature of the raw material is blown into the coking drum from the bottom or lower part of the drum.
3. The gas to be used for this purpose may desirably be vapor of any light hydrocarbon oil. In some cases, it is possible to use a gas such as hydrogen, nitrogen, steam, etc., which is non-oxidizing at a temperature region where the process of this invention applies.

4. The gas is blown into the coking drum through a single or a plurality of nozzles from the bottom or a lower part thereof, or any other position where the liquid raw material within the coking drum can be effectively agitated.
5. When the coking temperature reached, the heating of the raw material stops. In order, however, to maintain the uniform coking temperature to the end, blowing of the gas is further continued.
6. As the coking reaction proceeds, the raw material gradually increases its viscosity to become solidified.
7. In the production of high grade cokes such as needle-shaped cokes, it is necessary that the molecular structure having the arrangement and orientation of carbon as in the graphite crystal be grown sufficiently large, for the purpose of which the reaction of the entire raw material needs to proceed uniformly.
8. In the course of solidification, an operation of moving the liquid raw material by imparting thereto any kind of force in one direction would function very effectively.
9. The coking reaction is completed after following the above-mentioned process steps, although the gas is continuously blown to the end.
10. The coking reaction can be finished in a shorter time by further increasing the flow rate of the gas current to raise the heating temperature at the latter part of the coking reaction, after the major stage of controlling the grade of the produced cokes has been completed.

Task 2. Translate the summary of the invention into English

Краткое содержание изобретения

Главная цель (предмет) настоящего изобретения предоставить улучшенный метод производства кокса, при котором создаются оптимальные условия для процесса коксования, подходящего для различных сырых минеральных продуктов.

Другой цель настоящего изобретения предоставить улучшенный метод производства кокса при помощи вдувания не

окисляющегося газа в сырой (необработанный) материал в барабане коксования.

Еще одна цель данного изобретения предоставить улучшенный метод производства кокса, при котором сырая нефть подвергается тепловой обработке или изменяется до процесса коксования.

Следующая цель изобретения представить метод производства кокса, состоящий из двух этапов: обработка сырья и коксование обработанного сырья в одном барабане коксования с не содержащим кислорода азом нагреваемым, и средне перемешиваемым для коксования.

Task 3. Study the chart and translate the names of the production into Russian. Remember them

Name	NTD	Brief characteristic
Foundry coal coke (fraction +60 mm)	GST 3340-88	Ash level, % not more than 12.5. Resistance index M40, % not less than 73. Mass portion of cakes with the size less than 40 mm, % not more than 5
Foundry coke (fraction +40 mm)	GST 3340-88	Fineness (мелкозернистость) 40 mm and more. Ash level, % not more than 12.5. Resistance index M40, % not less than 73. Mass portion of cakes with the size less than 40 mm, % not more than 6
Metallurgical coke (fraction +25 mm)	Specification 1104-076100-001902437-159-96	Ash level, % not more than 12.5. Mass portion of total sulfur, % not more than 0.55. Devolatilization, % not more than 1.511. Mass portion of cakes with the size less than 25 mm, % not more than 8
Metallurgical coke from the coals of	Specification 1104-076100-	Ash level, % not more than 12.5. Mass portion of total sulfur, % not more than 0.55. Devolatilization, % not

Eastern regions (fraction 25–40 mm)	001902437-159-96	more than 1.511. Mass portion of cakes (коксовый пирог) with the size less than 25 mm, % not more than 8
Coking bean (fraction 10–25 mm)	GST 8935-77	Ash level, % not more than 13. Mass portion of total liquid, % not more than 20.0. Mass portion of cakes with the size more than 25 mm, % not more than 10. Mass portion of cakes with the size more than 10 mm, % not more than 15.0
Coke breez (fraction 0–10 mm)	Specification 14-7-115-89	Ash level, % not more than 16. Mass portion of total liquid, % not more than 22.0. Mass portion of cakes with the size more than 10 mm, % not more than 8.
Crude coal benzol	Specification 1104-241419-395-167-2001	Strippant till 140 °C, % not less than 97
Coal pitch	Specification 14-7-100-89	Mass portion of total liquid, % not more than 6. Ash level, % not more than 0.22. Insoluble in quinoline (хинолин) substances, % 6.5. Insoluble in toluol substances, % till 9.5. Gravity at 20 °C, kg/m^3 till 1.200