Добрый день, уважаемые студенты гр. 44ОПИ!

1. Запишите в тетрадь лексику.
2. Прочитайте и устно переведите тексты.
3. Письменно выполните упражнения.

***Vocabulary***

|  |  |
| --- | --- |
| *luster* – блеск*property* – свойство*quantity*- количество*conductivity*- проводимость*solid state*– твердое состояние*brittle*- хрупкий*undergo*- подвергаться | *to protect … from*– защищать от*environment*– окружающая среда*alloy*- сплав*poor conductor*– плохой проводник*distinction* - различие*strength*- прочность*hardness*– твердость |

**METALS AND NONMETALS**

There are some distinctions between metals and nonmetals. Metals are distinguished from nonmetals by their high conductivity for heat and electricity, by metallic luster and by their resistance to electric current. Their use in industry is explained not only by those properties, but also by the fact that their properties, such as strength and hardness, can be greatly improved by alloying them with other metals.

There are several important groups of metals and alloys. The common metals such as iron, copper, zinc, etc. are produced in great quantities.

The so-called precious metals include silver, gold, platinum and palladium. The light metals are aluminium, beryllium and titanium. They are important in aircraft and rocket construction.

Many elements are classified as semimetals (bismuth, for example) because they have much poorer conductivity than common metals.

Nonmetals (carbon, silicon, sulphur) in the solid state are usually brittle materials without metallic luster and are usually poor conductors of electricity. Nonmetals show great variety of chemical properties than common metals do.

Metals can undergo corrosion, changing in this case their chemical and electromechanical properties. In order to protect metals from corrosion the products made of metals and steel are coated by some films (coatings). Organic coatings protect metals and steel from corrosion by forming a corrosion-resistant barrier between metal or steel and the corrosive environment.

***Exercises***

**Ex. 1. Answer to the following questions:**

* + - 1. By what properties are metals distinguished from non-metals?
			2. What common metals are produced in great quantities?
			3. What metals are called light?
			4. What properties do non-metals have?
			5. What is done to protect metals from corrosion?

**Ex. 2. Match the beginning and the end of the sentences and translate them:**

There are some different groups of metals, such as:

|  |  |
| --- | --- |
| 1. light metals…
2. common metals…
3. precious metals…
4. nonmetals…
 | * 1. iron, copper, zinc…
	2. silver, gold, platinum…
	3. aluminium, beryllium, titanium…
1. carbon, silicon, sulphur…
2. aluminium, beryllium, titanium…
 |

**Ex. 3. Make up the sentences from the following words and translate them into Russian:**

* 1. There / several / alloys / groups / important / metals / of / and / are.
	2. Metals / corrosion / undergo / can.
	3. Organic / corrosion /coatings / protect / steel / metals / from /and.
	4. Many / are / as / elements / classified / semimetals.
	5. Nonmetals / properties / properties / chemical / show / great / variety / of.

***Vocabulary***

|  |  |
| --- | --- |
| *quantity* – количество*alloy* – сплав*carbon* – углерод*substance*– вещество*tough(ness*) – жесткий, жесткость*hard(ness)* – твердый, твердость*ductility* – ковкость | *malleability* – вязкость*tension* – растяжение*compression* - сжатие*rupture* – разрыв*strength* – прочность*breaking* - поломка |

**METALS**

Mankind has used metals for centuries in gradually increasing quantities but only now they are employed in really great quantities.

Today we know more than seventy metals, the majority of which are in industry.

Of all metals iron is the most important one. Absolutely pure iron is never prepared except for laboratory purpose. The iron and steels in use today are really alloys of iron, carbon and other substances. They can be made elastic, tough, hard, or comparatively soft.

Mechanical properties of metals are the result of their atomic structure. They include hardness, ductility and malleability which are of special importance in engineering.

Ductility is a capacity of a metal to be permanently deformed in tension without breaking.

Malleability is a capacity of a metal to be permanently deformed by compression without rupture.

These properties are similar to each other but not the same. Most metals increase these properties at higher temperatures.

The strength of a metal is the property of resistance to external loads and stresses.

These mechanical properties are of great importance in industrial purpose because all parts and units made of iron and steel must meet up-to-date demands.

**Exercises**

**Ex. 1. Find out as many words from the text as you can:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| q | a | m | p | d | u | c | t | i | l | i | t | y |
| u | h | a | r | d | b | a | l | f | q | e | v | u |
| a | l | l | o | y | s | r | j | a | n | j | i | f |
| n | s | l | k | s | u | b | s | t | a | n | c | e |
| t | t | e | n | s | i | o | n | l | d | y | a | c |
| i | d | a | g | t | l | n | z | e | c | e | b | o |
| t | f | b | b | r | u | p | t | u | r | e | g | i |
| y | g | i | e | e | m | c | f | a | x | n | i | h |
| f | l | l | h | n | q | w | e | r | t | y | u | i |
| s | j | i | y | g | f | g | h | z | d | g | h | l |
| x | k | t | o | t | o | u | g | h | c | y | c | u |
| a | l | y | f | h | a | b | c | f | y | e | b | m |

**Ex. 2. Answer to the following questions:**

1. What is the most important metal?
2. What mechanical properties of metals do you know?
3. What is strength?
4. What is ductility?
5. What is malleability?

**Ex. 3. Finish the sentences choosing the right end to each one and translate them:**

|  |  |
| --- | --- |
| 1. The most important metal in use today are…
2. Ductility is a capacity of a metal…
3. Malleability is a capacity of a metal…
4. The strength of a metal is the property…
 | * 1. carbon;
	2. iron;
	3. some other metal.
		1. …to resist to external loads and stresses.
		2. …to be permanently deformed by compression without rupture
		3. …to be permanently deformed in tension without breaking
 |

**ORES**

The term metal is reserved for that chemical element which has two or more characteristic of metals (ductility, malleability, etc.) and is good conductor of heat and electricity.

Ore minerals are concentrated in small, localized rock masses that form as a result of special geologic processes, and such local concentrations are called mineral deposits. Mineral deposits are what prospectors seek. The terms ore mineral and mineral deposit were originally applied only to minerals and deposits from which metals are recovered.

All deposits consist of several ore mineral. They are called gangue. The more concentrated an ore mineral, the more valuable the mineral deposit. A mineral deposit that has a rich level of concentration and big size sufficiently rich to be worked at a profit is called an ore deposit. The assemblage of ore minerals plus gangue in ore deposit is called the ore.

All ore deposits are mineral deposits. ‘Ore deposit’ is an economic term, while ‘mineral deposit’ is a geologic term. Whether a given mineral deposit is also an ore deposit depends on many factors:

a) the level of concentration,

b) the size of the deposit;

c) all factors that affect the mining, processing, and transporting of the ore must be considered as well.

Among such factors are:

a) the shape of a deposit,

b) its depth below the surface,

c) its geographic remoteness,

d) access to transportation,

e) the political stability of the region,

f) market factors (the price of the metal in world trade and the cost of borrowing the money needed to develop a mine).

Because market factors change continually, a given mineral deposit may sometimes be an ore deposit, but at other times it may be uneconomic and hence not an ore deposit.

Mineral deposits have been found both in rocks that lie beneath the oceans and in rocks that form the continents, although the only deposits that actually have been mined are in the continental rocks. The mining of ocean deposits lies in the future. The continental crust averages 35—40 kilometers in thickness, and below the crust the mantle lies. Mineral deposits may occur in the mantle, but with present technology it is not possible to discover them.

***Exercises***

**Ex. 1. Find in the text the words with the same root and translate them into Russian.**

*Example:* ductile (adj) – вязкий, пластичный; ductility (n) – вязкость, пластичность

Malleable (adj), conduct (v), availability (n), mine (v), tenden­cy (n), prospect (v), mixture (n), value (n), profitable (adj), assemble (v), geology (n), remote (adj), use (v), stable (adj), average (adj), thick (adj).

**Ex. 2. Choose the answer which you think fits best and translate the sentence into Russian**

1) Metals are

1. all chemical elements possessing some metallic prop­erties are metals;
2. not all chemical elements possessing metallic prop­erties are metals;
3. the main properties of metals are heat and electric conductivity;
4. metals are chemical elements available through smelting

2) The ore is

(a) a concentration of a single mineral;

(b) an assemblage of some valuable minerals;

(c) an assemblage of valuable and valueless minerals;

(d) an assemblage of ore minerals and valueless minerals;

3) The ore deposit is that..

(a) any deposit should be called so;

(b) rich deposits should be only called so;

(c) any deposits from which metals are recovered should be only called so;

(d) economic deposits should be called so.

4) Which of the following statement is true?

(a) Mineral deposits are discovered in the Earth’s crust and the mantle.

(b) Mineral deposits have been only found in the continental rocks.

(c) The present technology is not perfect to mine ocean deposits.

(d) Prospectors are going to extract ore from the mantle in future.