

Minerals And Ores

POINTS TO REMEMBER

- Minerals are substances that are naturally present in the earth and are not formed from animal or vegetable matter.
 - An ore is a naturally occurring solid material from which a mineral, generally a metal, can be profitably extracted.
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- Minerals are generally classified as metallic and non-metallic minerals.
 - Metallic minerals include iron ore, uranium, bauxite, manganese, gold, silver and copper.
 - Non-metallic minerals include limestone, mica, coal and petroleum.
 - Mining is the process of taking out minerals and other substances from the earth.
 - There are two types of mining—surface mining and underground mining.
 - It is important to conserve minerals as they take thousands of years to form.

IMPORTANT TERMS

Ferrous minerals : Minerals which contain iron, such as iron ore, manganese and chrome.

Non – ferrous minerals : Minerals that do not contain iron, such as gold, silver, copper and lead.

Ore : A naturally occurring solid material from which a particular mineral, usually a metal, can be profitably extracted.

THINK AND ANSWER

How would our life be affected if coal, petroleum and natural gas were exhausted in the next 30 years ?

Answer:

If all the exhaustible natural resources are exhausted by human activities, then the survival of living beings would not be possible. Actually, fossil fuels are the most important source of energy for us today.

They are concentrated source of energy and give off heat and light on burning. The heat can be used to cook food or to run engines such as automobile engines. It can be used to generate electricity as in powerhouse where the most common fuel used is coal. Everything will not be available.

VALUES AND LIFE SKILLS

Conventional energy resources—coal and petroleum— are very important for a country. Therefore, we need to be careful while using them.

Can you suggest some ways by which we can reduce the use of conventional energy resources ?

Answer:

1. Use more energy efficient by using energy saver products like LED lights etc.
2. Use Bicycles for shorter distances instead of cars or bikes.
3. Switch off the lights when not required.

EXERCISES

A. Fill in the blanks

1. All rocks are composed of **minerals**.
2. Minerals are obtained by a process called **mining**.
3. Metallic minerals are generally found in **igneous** rocks.
4. Ferrous minerals contain **iron**.
5. Peat has very little **carbon**.

B. Write true or false

1. Metals can be profitably extracted from ores.

Answer. True.

2. Metallic minerals are generally found in sedimentary rocks.

Answer. False.

Correct — Metallic minerals are generally found in igneous rocks.

3. Bauxite is the lightest metal.

Answer. True.

4. Bituminous coal has the highest carbon content.

Ans. False.

Correct — Anthracite coal has the highest carbon content.

5. Mica is a metallic mineral.

Ans. False.

Correct— Mica is a non-metallic mineral.

C. Answer the following questions in brief:

Question 1.

What is a mineral ?

Answer:

Minerals are substances that are naturally present in the earth and are not formed from animal or vegetable matter.

Question 2.

Name a few minerals.

Answer:

Diamonds, quartz, topaz, gypsum, iron, copper, bauxite, zinc, gold, silver, manganese, etc.

Question 3.

What is an ore ?

Answer:

An ore is a naturally occurring solid material that contains a large amount of a particular material, using a metal which can profitably extracted, eg. iron ores, copper ores, bauxite (from which aluminium is extracted) zinc, etc.

Question 4.

What is the main difference between a ferrous and a non- ferrous mineral ?

Answer:

Ferrous minerals :

1. These minerals contain iron.
2. They have high tensile strength.
3. Examples: Iron ore, manganese and chrome.

Non-ferrous minerals :

1. These minerals does not contain iron.
2. They have low tensile strength.
3. Examples: Gold, silver, copper and lead.

Question 5.

Mention any two characteristics of iron ore.

Answer:

The most important mineral in the world is iron ore. It is known for its hardness, strength and ductility (it can be made or stretched into a thin wire).

Question 6.

Mention the different types of iron ore.

Answer:

There are four different types of iron ores-haematite, magnetite, limonite and siderite.

Question 7.

What is surface mining ?

Answer:

When the top layer of soil is removed and the rocks that lie underneath are extracted with the help of heavy machinery is called surface mining. Surface mining is done to extract minerals that are found close to the surface such as coal and some kinds of sedimentary rocks like limestone and mica.

Question 8.

Mention any three uses of coal.

Answer:

Coal is used for various purposes like cooking, heating and producing electricity, and in various industries.

D. Answer the following questions in one or two paragraphs

Question 1.

Differentiate between metallic and non-metallic minerals.

Answer:

Metallic Minerals :

1. These minerals contain metals, which are hard substances.
2. These minerals found in igneous rocks.
3. Examples: Iron ore, bauxite, manganese and copper, etc.

Non-metallic Minerals :

1. These minerals do not contain extractable metals.
2. These minerals found in sedimentary rocks.
3. Examples: Coal, potash, limestone, gypsum, mica, etc.

Question 2.

Give an account of iron ore production in the world.

Answer:

Iron is the main metal used for making steel, which is used in almost all industries. The main producers of iron are China (42%), Australia (22%), Brazil (10%), South Africa, etc. India produces about 4% of total iron ore. Main states in India are Odisha, MP, Jharkhand, Andhra Pradesh, Tamil Nadu.

Question 3.

Give any three uses of copper.

Answer:**Uses of copper are :**

- Copper is mainly used in making electric and telephone wires.
- It is also used in making pipes and coins.
- Alloys such as brass and bronze are made using copper.

Question 4.

What are the two types of mining ? Elaborate on the differences between the two.

Answer:**The two types of mining are:**

1. **Surface mining** — It is the removal of top layer of soil and rocks, to extract the minerals lying underneath is called surface mining. Surface mining is done to extract minerals that are found close to the surface such as coal and some kinds of sedimentary rocks like limestone and mica.
2. **Underground mining** — It is the one in which a shaft is dug which is long, narrow passage and vertically deep into the ground and then people or heavy machinery is sent down, the tunnels are blasted using dynamite to extract the minerals, eg. gold, silver, etc.

In surface mining, the top layer of the soil is removed, large pits or holes are dug and the rocks that lie underneath are extracted with the help of heavy machinery. These pits are called open cast mines or quarries. Open cast mining is a common form of coal mining in India.

In surface mining, trees and other natural vegetation are destroyed. Surface mining is done to extract minerals that are found close to the surface such as coal and some kinds of sedimentary rocks like limestone and mica.

Underground mining: In underground mining, a shaft, which is a long, narrow passage, is dug vertically deep into the ground. People and machinery are then sent down through this shaft. Sometimes, after after

descending into the shaft, tunnels are blasted into the earth with the help of dynamite. Then the men and machines move about through these tunnels to take out things such as coal, gold, silver, tin, lead and copper. Underground mining causes sinking of the land, underground water pollution and surface water pollution, among other things.

Question 5.

Describe the importance of minerals.

Answer:

Minerals play an important role in our daily lives. A number of things of our daily use such as door knobs, latches, window grills, utensils, etc. are made of minerals. Iron and its alloy, steel, is used in making bridges, buildings, and wide range of machines and tools, which have made our life simpler and easier. Copper wires are used in our electrical and electronic gadgets. Copper tools and utensils are also widely used.

Gold and silver are used in making our jewellery. Aluminium extracted from bauxite is used to make aeroplanes, our fastest means of transport. Mica is used in electrical goods and limestone is used as cement in constructing houses and buildings.

Coal, petroleum and natural gas are important energy or power resources. Coal is used for various purposes like cooking, heating and producing electricity, and in various industries.

Once petroleum is refined, we obtain different products such as petrol, diesel, kerosene, cooking gas, etc. Vehicles such as cars, trucks, trains, etc. run on petrol and diesel. Kerosene is used for cooking and other purposes. Products such as plastics and cosmetics are also made from petroleum. Natural gas is used as a fuel in cars, buses, etc. and hence are important for the agricultural sector as well.

Question 6.

Why is it important to conserve minerals ?

Answer:

Minerals are important for every country for its development and they need to be conserve because :

1. Minerals are non-renewable resources which once used can't be obtained again as it takes thousands of years to form.
2. Workable minerals are in insufficient quantities (just 1 % of the earth's crust)
3. We are rapidly consuming mineral resources that requires millions of years to be renewed.

4. Industry and agriculture depend upon minerals and the substances manufacture from them.

E. Picture study.

Look at this picture of the inside of an iron and steel industry and answer the following questions

Question 1.

Which are the major producers of iron and steel in Asia?

Answer:

China produces almost 45 per cent of the total world production of Iron and Steel.

Question 2.

Which states in the south of India produce a large quantity of iron and steel ?

Answer:

Andhra Pradesh and Tamil Nadu are the major iron-producing states.