



GUIDELINES

Dear Students

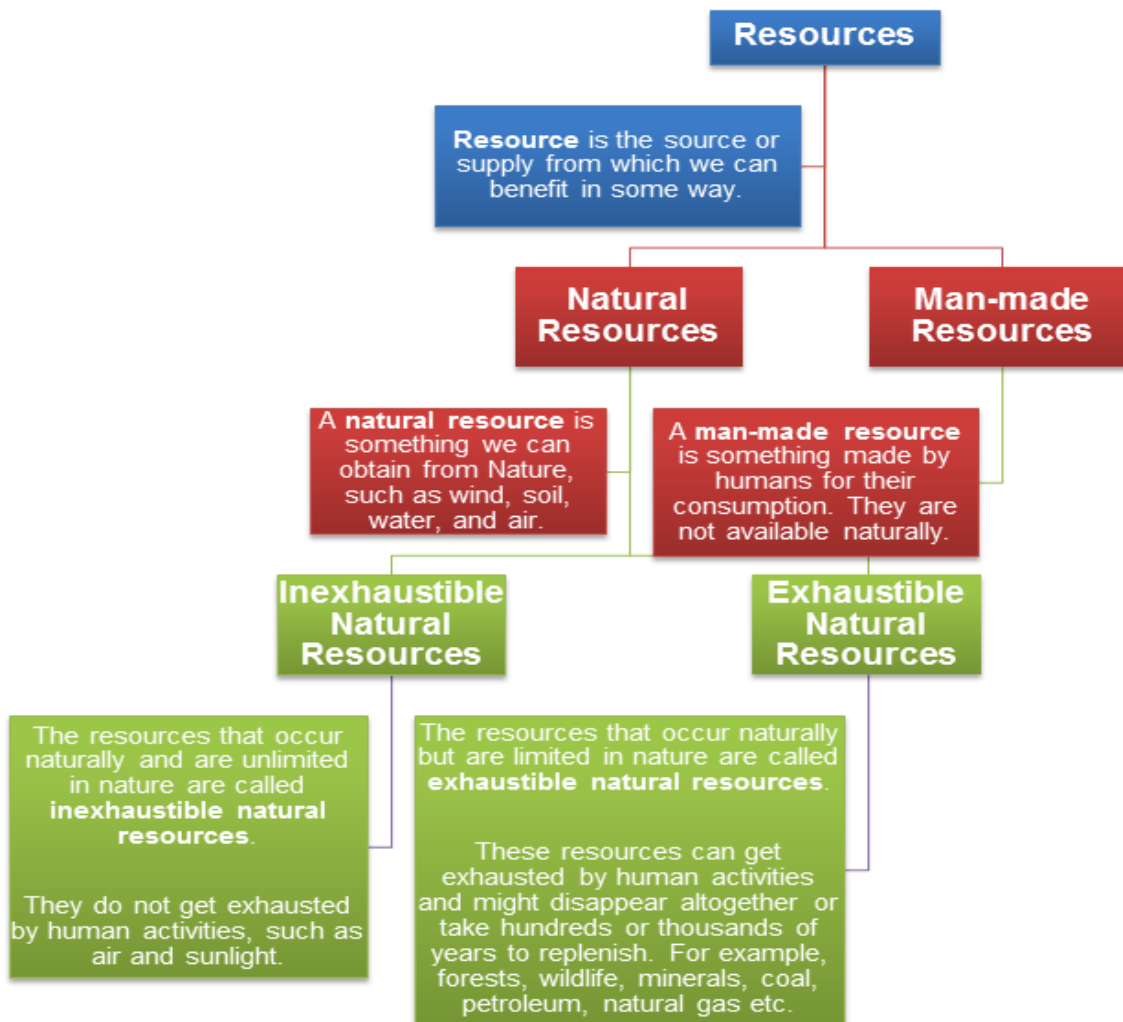
- This lesson is based on the chapter- **Coal And Petroleum**.
- This lesson will help you understand the concept of the chapter and attempt the assignment that follows.
- Refer to the link given below to read the chapter as given in the NCERT textbook.

https://drive.google.com/file/d/1z-m2ODECTKmHI2OpG6dRhZZYY0pp_tcj/view

SUBTOPICS

- Exhaustible and inexhaustible natural resources
- Fossil fuels
- Formation of coal
- Destructive distillation of coal
- Properties and uses of products obtained by destructive distillation of coal

1.1 EXHAUSTIBLE AND INEXHAUSTIBLE NATURAL RESOURCES



1.2 FOSSIL FUELS

Fossil fuels are buried organic substances such as, dead plants and animals that got deposited under several thousand feet of silt. These deposits decayed with the passage of time and got converted to natural gas, coal and petroleum due to the extreme heat and pressure in the earth's crust. They are also known as non-renewable sources of energy as it takes a very long time for them to replenish.

Fossil fuels are:

- Coal
- Petroleum
- Natural gas

1.2.1 Coal and its formation

It is a black and hard substance. It is a sedimentary rock that burns.

1. It is composed of carbon, hydrogen, oxygen and minor amounts of sulphur and nitrogen.
2. The major types of coal are Anthracite, Bituminous and Lignite.
3. Anthracite is the hardest coal with higher carbon concentration and energy.
4. Lignite is the softest coal. It has low carbon concentration.
5. Bituminous has moderate hardness and concentration of carbon.

Formation of Coal

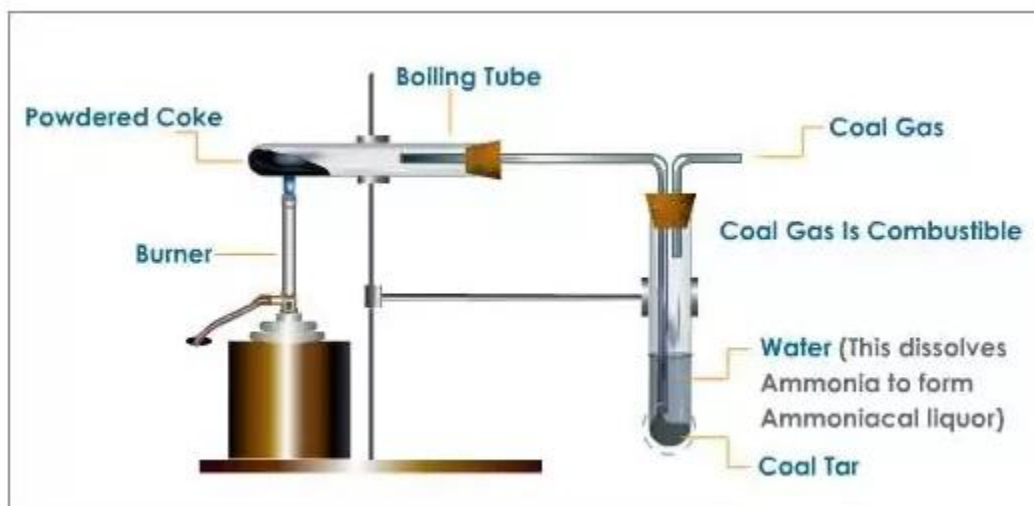
1. Many years ago, the dense forests present in low lying areas of wetlands got buried in the soil due to natural calamities such as floods earthquakes, etc.
2. They got compressed with time, as more soil deposited on them.
3. They descended deeper and deeper, and encountered high temperature and pressure.
4. These dead plants slowly got converted into coal under high temperature and pressure.
5. The main constituent of coal is carbon, therefore, this process of conversion of dead plants into coal is termed as **carbonization**.

Refer the following video link for better understanding of the process of formation of coal:

<https://www.youtube.com/watch?v=QEa36qNo86E>

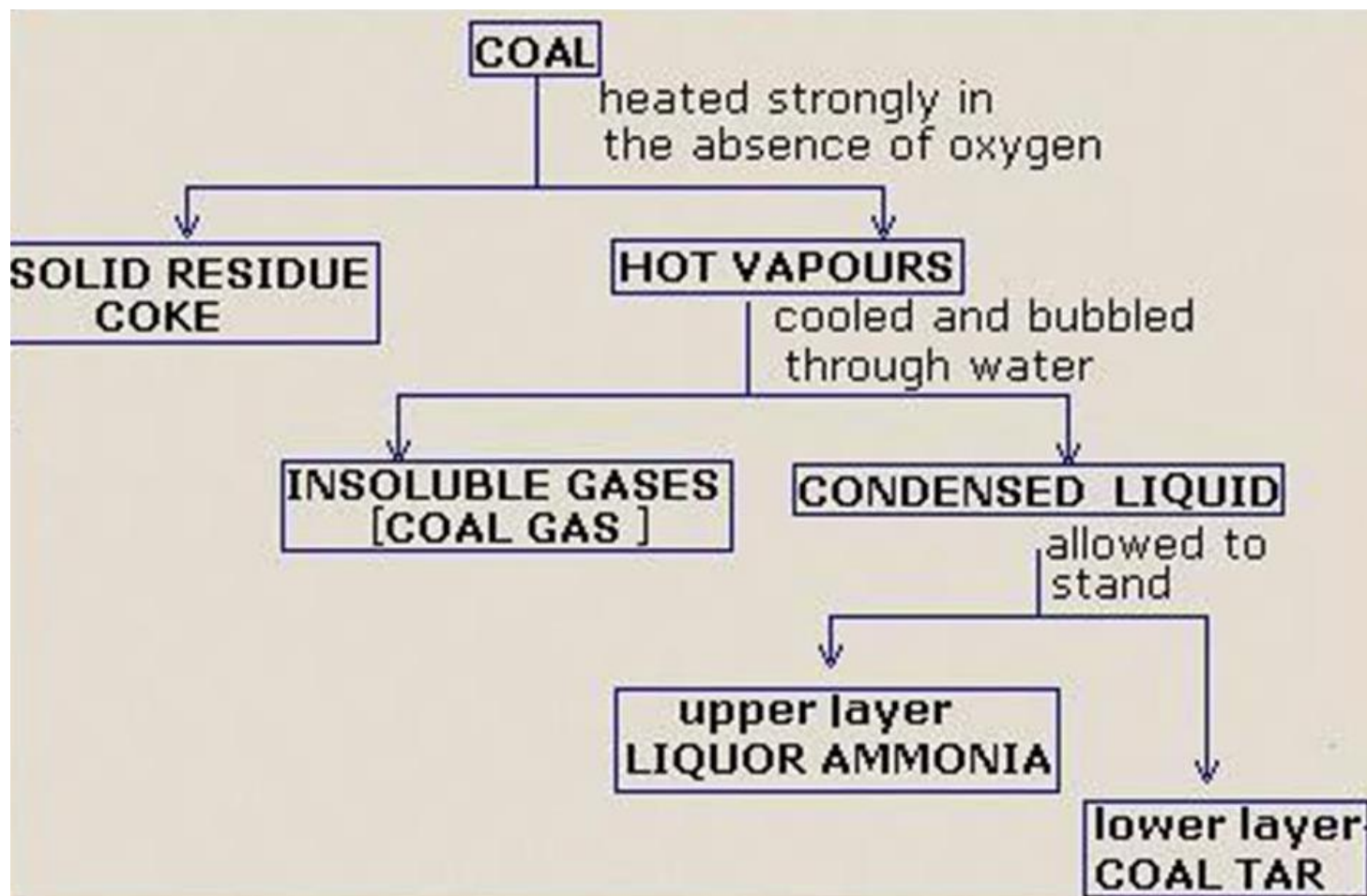
Destructive Distillation of Coal

What is destructive distillation?



Destructive Distillation

It is a process in which coal is heated at very high temperature in the absence of air to obtain various useful products from it. Consider the diagrams (above and below) to understand the process of destructive distillation. Different products obtained through this process are coal gas, coal tar, coke and liquor ammonia.



Properties and Uses of products obtained by destructive distillation of coal

Coke	Coal Tar	Coal Gas
<ul style="list-style-type: none">• Tough, porous, and black substance• Almost pure carbon• Used in manufacturing of steel and in extraction of many metals• <i>The processing of coal to get coke also yields coal gas.</i>	<ul style="list-style-type: none">• Black, thick liquid with unpleasant smell• Mixture of about 200 substances• Yields many products that are used as raw materials to manufacture drugs, explosives, naphthalene balls, perfumes, synthetic dyes, paints, plastics, roofing materials, photographic materials etc.• <i>Earlier, coal tar was used for metalling the roads. Now, bitumen (a petroleum product) is used for the purpose.</i>	<ul style="list-style-type: none">• By-product of processing of coal to get coke• Used in many industries as fuel• Mainly used as heat source (and not as a light source)• <i>Once used for street lighting. It was used for this purpose for the first time in London in 1810, and for the first time in New York in 1820.</i>

ASSIGNMENT (To be attempted in Chemistry notebook)

Q1. Multiple choice Questions

- A. The gas obtained during the processing of coal to get coke is
- (i) Carbon monoxide
 - (ii) Carbon dioxide
 - (iii) Sulphur dioxide
 - (iv) Coal gas
- B. The process of conversion of dead vegetation into coal is called
- (i) Ionization
 - (ii) Carbonization
 - (iii) Refining
 - (iv) Lubrication

C. The following products whose origin is coal tar is

- (i) Cellulose
- (ii) leather
- (iii) clay
- (iv) Naphthalene balls

D. Pick a pair in which the first one is an example of exhaustible resources and the second one is an example of inexhaustible resources.

- (i) Water and Sunlight
- (ii) Petroleum and Water
- (iii) Natural gas and Coal
- (iv) Wind and Natural gas

Q2. Fill in the blanks.

- (a) Coal is one of the _____ used to cook food .
- (b) When heated in air ,coal burns and produces mainly _____ gas.
- (c) Coal tar is a black ,thick _____ with _____ smell.
- (d) _____ , _____ and _____ are fossil fuels .
- (e) Forests and wildlife are _____ natural resources.

Q3. Sunlight and air are inexhaustible natural resources. Comment.

Q4. State the characteristics and uses of the products obtained when coal is processed in industry.

Q5. What are fossil fuels? Explain briefly the formation of coal in the earth's crust.
