

COAL AND PETROLEUM

1.a.Exhaustible Sources of Energy: These are energy sources that are limited in nature and can be depleted by continuous use. These sources are either non-renewable or will take prolonged period of time to be renewed. Examples: Coal, Petroleum, Natural Gas, LPG, Wood.

1.b.Inexhaustible Sources of Energy: These are energy sources that are unlimited and cannot be exhausted, no matter how much they are used. Examples: Sunlight, Wind, Tidal energy, Geothermal energy. These sources are renewable.

2. RAW COAL AND CRUDE OIL

Coal is a black or brownish-black sedimentary rock formed from the remains of plants that lived and died millions of years ago. It is primarily composed of carbon, along with hydrogen, sulphur, oxygen, and nitrogen and is used as a major source of energy and fuel.

Raw coal is the unprocessed coal obtained directly from mines. It contains physical impurities such as soil, rocks, and moisture and chemical impurities like sulphur and nitrogen.

Petroleum is a naturally occurring liquid fossil fuel found beneath the Earth's surface, formed from the remains of ancient plants and animals. It is a mixture of hydrocarbons and other organic compounds and is refined to produce fuels like petrol, diesel, kerosene, LPG, and many industrial products.

Crude oil (also called raw petroleum) is a naturally occurring, unrefined liquid fossil fuel found underground or under sea floor. It is a mixture of hydrocarbons and other organic compounds.

3. CATEGORIES OF COAL

Category of Coal	Carbon Content	Uses
Anthracite	80–95%	Domestic heating, industrial furnaces
Bituminous	60–80%	Electricity generation, making coke for steel industry
Lignite	40–60%	Power generation in thermal power plants
Peat	Upto 40%	Used as fuel in some regions, soil conditioner

4. BY PRODUCTS OF COAL AND THEIR USES (*Also read from NCERT content)

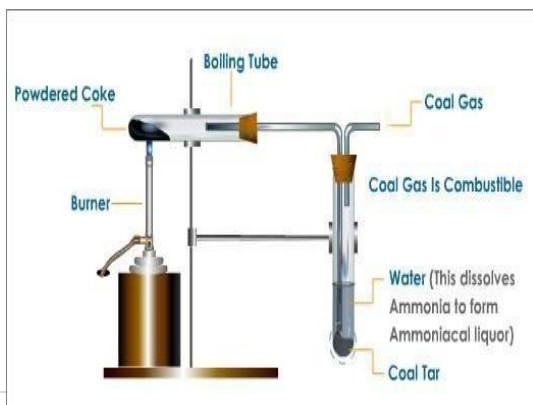
<u>By-Product</u>	<u>Characteristics</u>	<u>Uses</u>
Coke	Solid, porous form of carbon	Manufacture of iron and steel
Coal Tar	Thick, black liquid	Making dyes, drugs, perfumes, synthetic fibres, plastics, pesticides
Coal Gas	Mixture of hydrogen, methane and carbon monoxide	Used as a fuel for heating
Ammonical Liquor	Liquid containing ammonia compound	Used in manufacturing fertilizers

5. BY PRODUCTS OF PETROLEUM AND THEIR USES (Source NCERT)

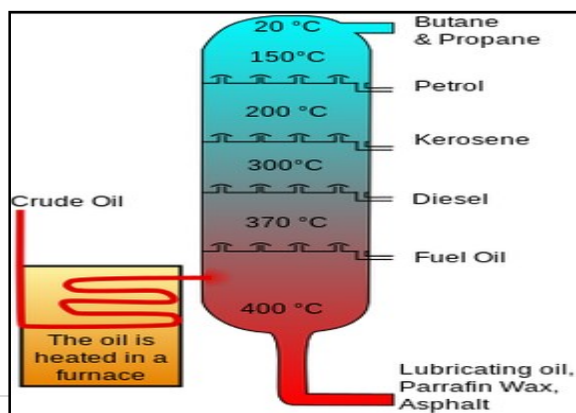
S.No.	Constituents of Petroleum	Uses
1.	Petroleum Gas in Liquid form (LPG)	Fuel for home and industry
2.	Petrol	Motor fuel, aviation fuel, solvent for dry cleaning
3.	Kerosene	Fuel for stoves, lamps and for jet aircrafts
4.	Diesel	Fuel for heavy motor vehicles, electric generators
5.	Lubricating oil	Lubrication
6.	Paraffin wax	Ointments, candles, vaseline etc.
7.	Bitumen	Paints, road surfacing

6. DESTRUCTIVE DISTILLATION OF COAL AND FRACTIONAL DISTILLATION OF PETROLEUM

(Audio-Visual Explanation done in class)



Destructive Distillation of Coal



Fractional Distillation of Petroleum

7. FORMATION OF COAL AND PETROLEUM AS FOSSIL FUELS (Source NCERT)

About 300 million years ago the earth had dense forests in low lying wetland areas. Due to natural processes, like flooding, these forests got buried under the soil. As more soil deposited over them, they were compressed. The temperature also rose as they sank deeper and deeper. Under high pressure and high temperature, dead plants got slowly converted to coal. As coal contains mainly carbon, the slow process of conversion of dead vegetation into coal is called carbonisation. Since it was formed from the remains of vegetation, coal is also called a fossil fuel.

Petroleum was formed from organisms living in the sea. As these organisms died, their bodies settled at the bottom of the sea and got covered with layers of sand and clay. Over millions of years, absence of air, high temperature and high pressure Impervious rock Water Gas Oil transformed the dead organisms into petroleum and natural gas.

8. MULTIPLE POLLUTION DUE TO BURNING OF COAL AND SOCIAL ETHICS

Burning coal releases carbon dioxide, sulfur dioxide, nitrogen oxides, and fine particles, causing air pollution, acid rain, and global warming. It harms health by triggering respiratory and heart diseases. Coal combustion also produces toxic ash, polluting land and water, and damaging the environment.
