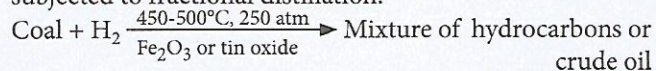


Synthetic Petrol

Since petroleum is non-renewable source, efforts have been made to synthesize petrol from coal or coal products.

1. Bergius Process (Hydrogenation of coal)

In this process, finely powdered coal and catalyst ferric oxide Fe_2O_3 (or tin oxide) is made into paste with heavy oil. The paste is then heated at $450\text{--}500^\circ\text{C}$ in a current of hydrogen at $200\text{--}250$ atm pressure. The product of hydrogenation is subjected to fractional distillation.



2. Fischer-Tropsch Process

In this process, water gas ($\text{CO} + \text{H}_2$) is mixed with hydrogen gas and then passed over a catalyst at 200°C under a pressure of $5\text{--}10$ atm.



Petrochemicals

Chemical organic compounds derived directly or indirectly from petroleum or natural gas are called petrochemicals.

► LPG AND CNG (PETROLEUM GASES)

1. Liquefied Petroleum Gas (LPG)

LPG is mainly a mixture of propane, propene, *n*-butane, isobutane, butene and small amount of ethane. Major sources of LPG are natural gas, products from refining and cracking of petroleum. LPG is mainly used as a fuel for house hold, automobiles and petrochemical industry.

2. Compressed Natural Gas (CNG)

Natural gas compressed at very high pressure is known as compressed natural gas. CNG consists mainly of methane (90%) along with small amount of ethane, propane, butane, vapours of low boiling pentanes and hexane. CNG is better automobile fuel than petrol because of high octane number (130).

CNG is clean fuel causing lesser pollution because of the complete combustion in the cylinder and has no requirement of anti-knocking agents.

✓ LPG and CNG both have highly knock-resistant. Hence, no anti-knocking additives are required for their use as fuels in automobiles.

MCQs

Multiple Choice Questions

- The conversion of liquid hydrocarbon into a mixture of gaseous compounds by heat alone is known as
 - hydrolysis
 - reduction
 - oxidation
 - cracking.
- Natural gas is a mixture of
 - $\text{CO} + \text{CO}_2$
 - $\text{CO} + \text{N}_2$
 - $\text{CO} + \text{H}_2 + \text{CH}_4$
 - $\text{CH}_4 + \text{C}_2\text{H}_6 + \text{C}_3\text{H}_8$
- Petrol or gasoline used as an automobile fuel is a mixture of
 - hydrocarbon
 - alcohols
 - carbohydrates
 - hydrocarbons and alcohols.
- Out of the following fractions of petroleum, the one having the lowest boiling point is
 - kerosene
 - diesel oil
 - gasoline
 - heavy oil.
- Most of the hydrocarbons from petroleum are obtained by
 - fractional distillation
 - fractional crystallisation
 - vaporisation
 - polymerisation.
- Tetraethyl lead is used as
 - fire extinguisher
 - pain killer
 - petroleum additive
 - mosquito repellent.
- On cracking petrol we get
 - CH_4
 - C_3H_6
 - Both of the above
 - $\text{CH}_3 + \text{CH}_4 + \text{C}_2\text{H}_6 + \text{alcohols}$.
- Iso*-octane is added to petrol
 - to precipitate inorganic material
 - to prevent freezing of petrol
 - to increase the boiling point of petrol
 - to increase octane number.
- Oil obtained from petroleum is called
 - essential oil
 - vegetable oil
 - mineral oil
 - animal oil.
- A knocking sound is produced more in the engine when the fuel contains mainly
 - n*-Alkanes
 - CO_2
 - CO
 - Lubricating oil.
- The gas believed to be the cause of explosion in coal-mines is
 - methane
 - ethane
 - C_3H_8
 - CO.
- The synthesis gas is
 - CH_4
 - C_2H_2
 - $\text{CO} + 3\text{H}_2$
 - NH_3 .
- Octane number is
 - number of carbon atoms in octane
 - number of molecules of octane formed in cracking of 1.0 g of gasoline