

Lecture - 6



PETROLEUM PRODUCTS

- ▣ Liquefied Petroleum Gas
- ▣ Naphthas
- ▣ Motor spirit
- ▣ Kerosine
- ▣ Aviation turbine fuels
- ▣ Diesel fuels
- ▣ Fuel oils
- ▣ Petroleum hydrocarbon solvents
- ▣ Lubricating oils
- ▣ Petroleum waxes
- ▣ Bitumens
- ▣ Petroleum coke

LIQUEFIED PETROLEUM GAS

- ▣ LPG is a mixture of light hydrocarbons derived from petroleum which are gaseous at normal ambient temperature and atmospheric pressure but condensed to liquid state at ambient temperature by application of moderate pressure.
- ▣ They are normally used as gases , they are stored and transported as liquids under pressure

COMPOSITION OF LPG

- ▣ Mixture of saturated and unsaturated hydrocarbon in the $c_3 - c_4$ range.
- ▣ Example propane propylene butane butylene
- ▣ LPG separated from heavier hydrocarbons by Straight distillation process contains only the saturated hydrocarbons whereas LPG obtained by conversion process such as thermal or catalytic cracking , reforming and hydrocracking contains both saturated and unsaturated hydrocarbons.

- ▣ BIS have categorized LPG as –
- ▣ Commercial butane
- ▣ Commercial butane and pentane
- ▣ Commercial pentane

PROPERTIES OF LPG

- ▣ High calorific value
- ▣ The gross calorific value of commercial propane and commercial butane are 50 and 49.3 MJ/kg
- ▣ LPG has very low sulphur content .
- ▣ The density of LPG in liquid state is about half that of water.
- ▣ LPG is odourless , a distinctive odour is added to aid in detection in the case of leakage.

PROPERTIES OF LPG

- ▣ LPG is non corrosive to steel .
- ▣ It has no lubricating properties.
- ▣ It is colourless in liquid or vapour phase.
- ▣ In the vapour phase LPG is slightly anesthetic if it is inhaled in high concentration.
- ▣ Less soluble in water .
- ▣ Soluble in organic solvents and alcohol.

PRODUCTION OF LPG

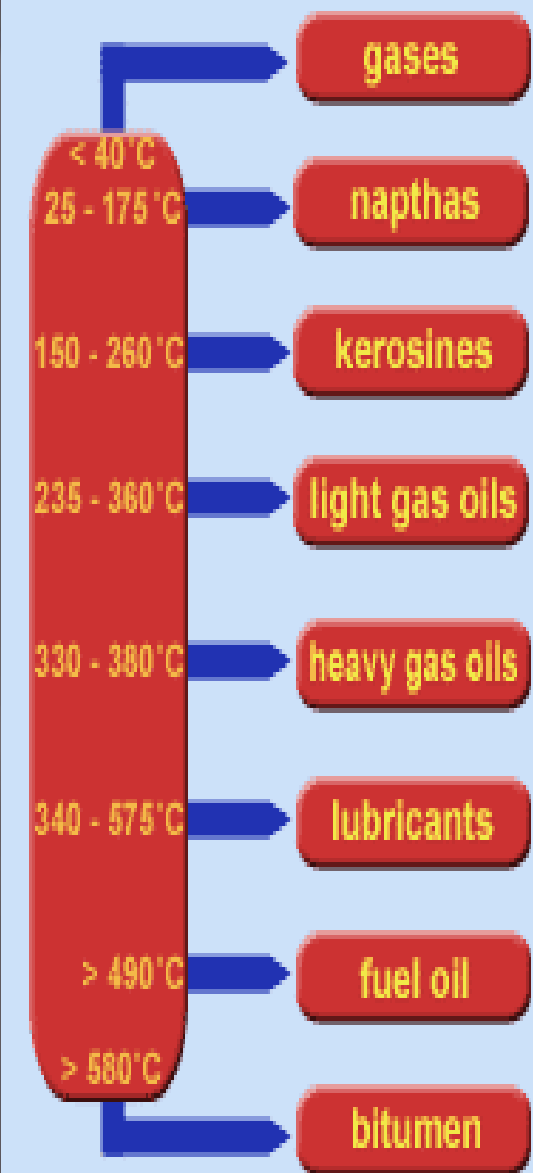
- ▣ Extraction of LPG from natural gas at well head .
- ▣ Refining of crude oil .

Extraction of LPG from Natural gas

- ▣ Extraction of LPG from natural gas
- ▣ There are several processes by which LPG can be extracted from natural gas , these are-
 - ▣ Compression and cooling
 - ▣ Adsorption
 - ▣ Absorption
 - ▣ Cryogenic processes

Refining of crude oil

- Refinery operation starts with the fractional distillation of the crude oil. The overhead product from the crude distillation column which is unstablished gasoline boiling upto 140°C is condensed in the overhead condenser and fed to stabiliser, where LPG is obtained as top product.



	SUBSTANCE	USES
<p>LOWEST BOILING POINT</p> <p>HIGHEST BOILING POINT</p>	gases	propane and butane gas for lighter fuel and camping stoves
	naphtha	chemicals for medicines, plastics, paints, cosmetics and clothing materials
	gasoline	petrol for vehicles
	kerosene	jet fuel and paraffin
	diesel oils	diesel fuel
	lubricating oils	machine oil, waxes and polishes
	fuel oil	fuel for ships and central heating
	residue	bitumen for road surfaces and roofing materials

LPG Treatment

- ▣ For indian crudes mercaptan level is below 50 ppm , caustic wash is only required.
- ▣ Cracked LPG from FCC unit requires amine wash for H₂S removal followed by merox treatment.
- ▣ Merox process is one of the oxidation of the mercaptans with air in alkaline medium in presence of chelated iron compound catalyst.

Odourisation

- ▣ Being a gas LPG should be most easily detectable by smell alone.
- ▣ Most commonly used substances are low molecular weight organic thiols and serve as effective odour in diluent form exp: ethyl and propyl mercaptans .

Uses

- ▣ LPG is used as a domestic fuel , fuel for internal combustion engine and feedstock for the manufacture of various chemicals and olefins.
- ▣ LPG supplied for domestic purpose is usually a mixture of propane and butane .

Thank you