SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF CHEMISTRY

19CHB101 - CHEMISTRY FOR ENGINEERS

I YEAR -I SEM

UNIT III – FUELS AND COMBUSTION

TOPIC – GASEOUS FUELS

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Guess Today's Topic

Gaseous fuels

Topics

- Gaseous fuels are obtained either naturally or by the treatment of solid or Liquid fuel
- Among the naturally ocurring gaseous fuels,Natural gas,Liquified Petroleum Gas(LPG) and compressed Natural Gas(CNG) are more important.
- These gases have high calorific value,

Characteristics of Gaseous fuel

- Gaseous fuels do not leave any residue after burning.
- Gaseous fuels burn without any smoke.
- Gaseous fuels have higher calorific values than the solid fuels.
- Gaseous fuels have relatively low ignition temperature and hence they burn more easily than solid fuels.
- Gaseous fuels are free from solid and liquid impurities.
- Gaseous fuels are often less expensive than solid and liquid fuels.
- They can be conveyed easily through pipeline.

Liquified Petroleum Gas

- LPG is obtained during the fractional distillation of crude oil
- It can be stored and transported easily in cylinders
- The average composition of LPG is Propane - 24.7 %, Butane - 38.5 %, Isobutane - 36.7& Others - 0.1 %
- Its calorific value is 27800 kcal. / m^3.

Properties

❖LPG is easily controllable so it helps consumers to cook with desired heat or flame intensity.

❖It is readily liquefied under moderate pressure

❖As a liquid, it looks a lot like water.

❖ It is colourless and odourless in its natural state

❖LPG at atmospheric temperature and pressure is a gas which is 1.5 to 2.0 times heavier than air.

Uses

❖It is used as domestic and industrial fuel.

❖It is also used as motor fuel.

❖LPG is also used as a fuel in internal combustion engine.

Class room Activity

Compressed Natural Gas

- Compressing the natural gas under pressure of 1000 atm in a steel container
- It mainly consist of methane
- The composition of CNG is Methane – 88.5 %, Ethane – 5.5 %, Propane – 3.7 %, Butane – 1.8 % and Pentane – 0.5 %.

Properties

❖CNG is; the cheapest, cleanest and least environmentally impacting alternative fuel.

❖Vehicles powered by CNG produce less carbon monoxide and hydrocarbon (HC) emission.

❖. It is less expensive than petrol and diesel.

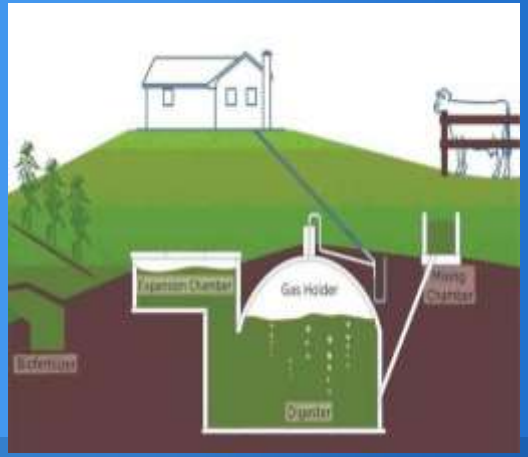
❖The ignition temperature of CNG is about 550°C. CNG requires more air for ignition

Uses

❖It is used as a substitute for petrol and diesel in automobiles

Bio Gas

- Biogas is a type of biofuel that is naturally produced from the decomposition of organic waste in the absence of oxygen
- When organic matter, such as food scraps and animal waste, break down in an anaerobic environment (an environment absent of oxygen) they release a blend of gases called biogas.
- it is a renewable energy source



Properties

- It is about 20% lighter than air(Density is about 1.2mgs/Liter)
- Ignition Temperature is about 650-750^{o}C
- Calorific value is 5000 kcal./m^{3}
- Clean fuel
- No residue and smoke produced
- Non polluting&Economical

Uses

- Domestic fuel
- For street lighting
- For generation of electricity
- If compressed,it can replace compressed natural gas for use in vehicles

Assessment

Choose the correct option for each gaseous fuel

01	**LPG**	✓ It mainly consists of methane gas ✓ It has high calorific value ✓ It can be stored and transported easily in cylinders
02	**CNG**	✓ It is used as a substitute for petrol and diesel in automobiles ✓ It mainly consists of methane gas ✓ It burns with smoky and sooty flame
03	**Bio Gas**	✓ It mainly consists of methane and carbon dioxide ✓ Economical and clean fuel ✓ It can be prepared from cow dung.

THANK YOU