

Fuels & Combustion

Introduction:-

Fuels are the main energy sources for industry and domestic purposes.

“A fuel is a substance containing carbon as the major substituent which provides energy on combustion for industry and domestic purposes”.

The combustion is the process of oxidation that provides heat energy. Every combustion is an oxidation but every oxidation is not combustion.

Ex: - Combustion of wood, Petrol and kerosene gives heat energy.

4.2 Classification of Fuels:-

Classification of fuels is based on two factors.

1. Occurrence (and preparation)
2. The state of aggregation

On the basis of occurrence, the fuels are further divided into two types.

A. natural or primary fuels: - These are found in nature such as Wood, peat, coal, petroleum, natural gas etc.

B. artificial or secondary fuels: - These are prepared artificially from the primary fuels.

Ex: - charcoal, coke, kerosene, diesel, petrol, coal gas, oil gas, producer gas, blast Furnace gas etc.

4.3 Characteristics of a good fuel:-

1. The fuel should be easily available.
2. It should be dry and should have less moisture content. Dry fuel increases its calorific value.
3. It should be cheap, easily transportable and has high calorific value.
4. It must have moderate ignition temperature and should leave less ash after combustion.
5. The combustion speed of a good fuel should be moderate.
6. It should not burn spontaneously to avoid fire hazards.
7. Its handling should be easy and should not give poisonous gases after combustion.
8. The combustion of a good fuel should not be explosive.

The second classification is based upon their state of aggregation like:

a) Solid fuels;

b) Liquid fuels and

c) Gaseous fuels.

Type of fuel	Natural or primary fuel	Artificial or secondary fuel
Solid	Wood, peat, lignite, dung, bituminous coal and anthracite coal	Charcoal, coke etc.
Liquid	Crude oil	Petrol, diesel and various other fractions of petroleum

Gaseous	Natural gas	Coal gas, oil gas, bio gas, water gas etc.
----------------	--------------------	---