Expt.No.- 4

AIM: Determination of Calorific value (Heating value) of gaseous fuel.

Apparatus:

1. Junker's Gas Calorimeter (Make: Toshniwal Instruments, Chennai)
2. Thermometer
3. Gas flow meter
4. Measuring cylinder & stop watch

Specifications:

- Gas flow rate: 3 l/min.
- Max. allowable temperature rise of water: 12 oC

Working principle:

A known value of gas is burned in the presence of air at constant pressure in the insulated combustion chamber so as the amount of heat given up by the gas is completely absorbed by the circulating cooling water and the calorific value is determined by equating the heat released in the combustion chamber and heat absorbed by the circulating water in a given interval of time.

Formula used:

$$\boldsymbol{calorific\ value} = \frac{\boldsymbol{W \times (T2 - T1) \times 1000}}{\boldsymbol{V}}\ \boldsymbol{kCal/m^3} \text{ or}$$

$$= \frac{\boldsymbol{W \times 4.18 \times (T2 - T1) \times 1000}}{\boldsymbol{V}}\ \boldsymbol{kJ/m^3}$$

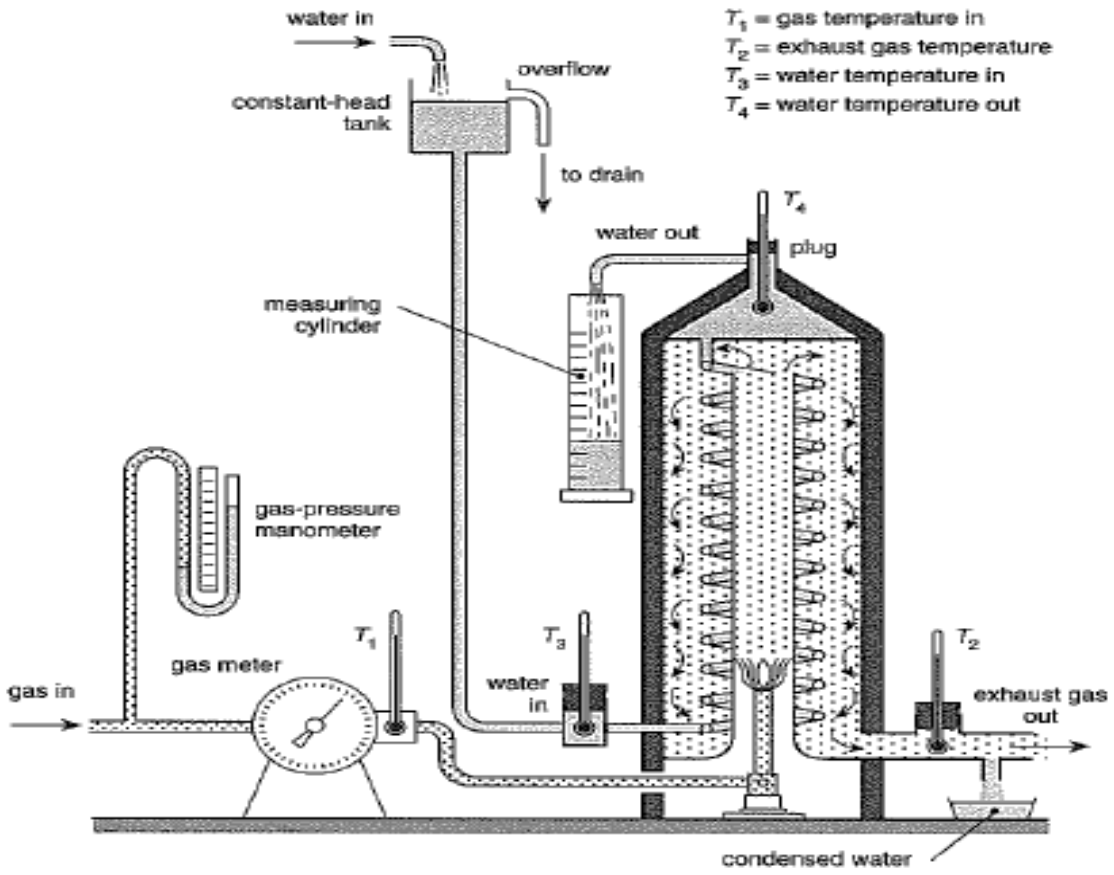
Where, W = water collected in liters

$V = volume\ if\ gas\ passed\ in\ liters$

$T1 = cold\ water\ temperature\ in\ o_C$

$T2 = hot\ water\ temperature\ in\ o_C$

Schematic diagram:



Construction & Working: (To be completed by the group)

Procedure to determine the heating value: (To be completed by the group)

Observation Table: (To be completed by the group)

S. No.	Time Sec.	Volume of gas passed Liters	Volume of water passed Liters	Temp. of water in ^{o} C		C.V. at ambient conditions kCal/m^3
				Entry (cold)	Exit (hot)	
1.						
2.						
3.						
4.						
5.						

Sample Calculation: (To be completed by the group)

Error Analysis: (To be completed by the group)

Conclusion: (To be completed by the group)