flow rates of 280g/h and 351g/h where the CO_2 is decreased by 11% to 18% respectively. Nevertheless, the lower C-H ratio of the fuel acetylene gives out lower carbon dioxide emission in the acetylene enriched modified engine.

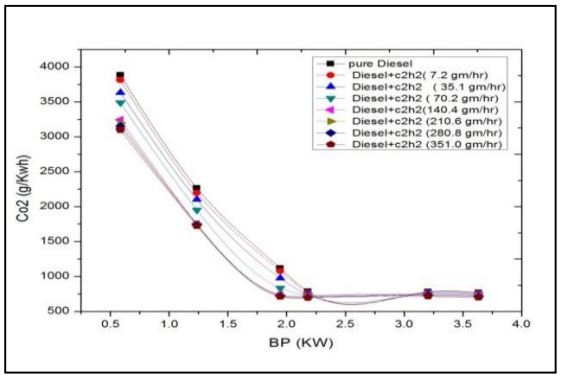

Fig. 10 Variations of BP and CO_2

Conclusions

The experimental work was conducted to study and recognize the capability to execute and run such an engine which uses acetylene enhanced charge by blending acetylene with the air that is supplied amid suction stroke into the chamber, and moreover the quality of emission gases of such modified diesel engine. The following conclusions were drawn after careful analysis and observation.

The essential conclusion that we make is that it is promising to work a diesel engine of the direct infusion sort easily with stable ignition utilizing acetylene as an improved fuel to the engine air and by changing the acetylene stream rate from 7.2g/h to280g/h with no unusual burning in the engine. In the event of faster stream rates it further increases and there is a tendency of knocking inclination in the ignition.

With little modifications in the diesel injection timing and quantity of acetylene added to the inlet air the optimum fuel flow rate is 5Lpm,and better brake thermal efficiency can be achieved. It is experimentally verified and proved that the optimum injection timing is 6^0bTDC and correspondingly the acetylene enrichment is about 280g/h for the modified engine. Therefore, it can be concluded that compared to the standard diesel engine the modified engine is 8% more efficient. However the NOx emission comparatively increases by 6.4% at 110 g/h and continuously scales up to 6.5% at 210g/h, and stays steady at 6.5% for further increase of charge which is quite dissimilar to the standard engine which works at full load.

On the other hand the smoke levels do not follow the same trend as the NOx are but they steadily grow. At a charge input of 280g/h it was only 1.04%, which rose up to 3.07%. Hydrocarbon emissions were noticed to be diminishing to be marginal in comparison with standard diesel engines. It is almost 17% less in acetylene enriched engine when compared to a diesel engine.

The CO in engine exhaust was seen unimportant when compared with the benchmark diesel engine. However, CO_2 also decreased from 4.8% to 7.65% of the charge flow rates of 140g/h to 280g/h respectively.

At last it is reasoned that the acetylene rich diesel engine is constructible and safe to operate without major design modifications, with reduced hydrocarbon and carbondioxide emission, but in contrast with more NOx emissions and with no noteworthy change in CO emission levels. The thermal efficiency of an engine can be improved with an interesting possibility of acetylene as an IC engine fuel in the years to come.

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