

Development of Technology for DME Fuelled Automotive Diesel Engine

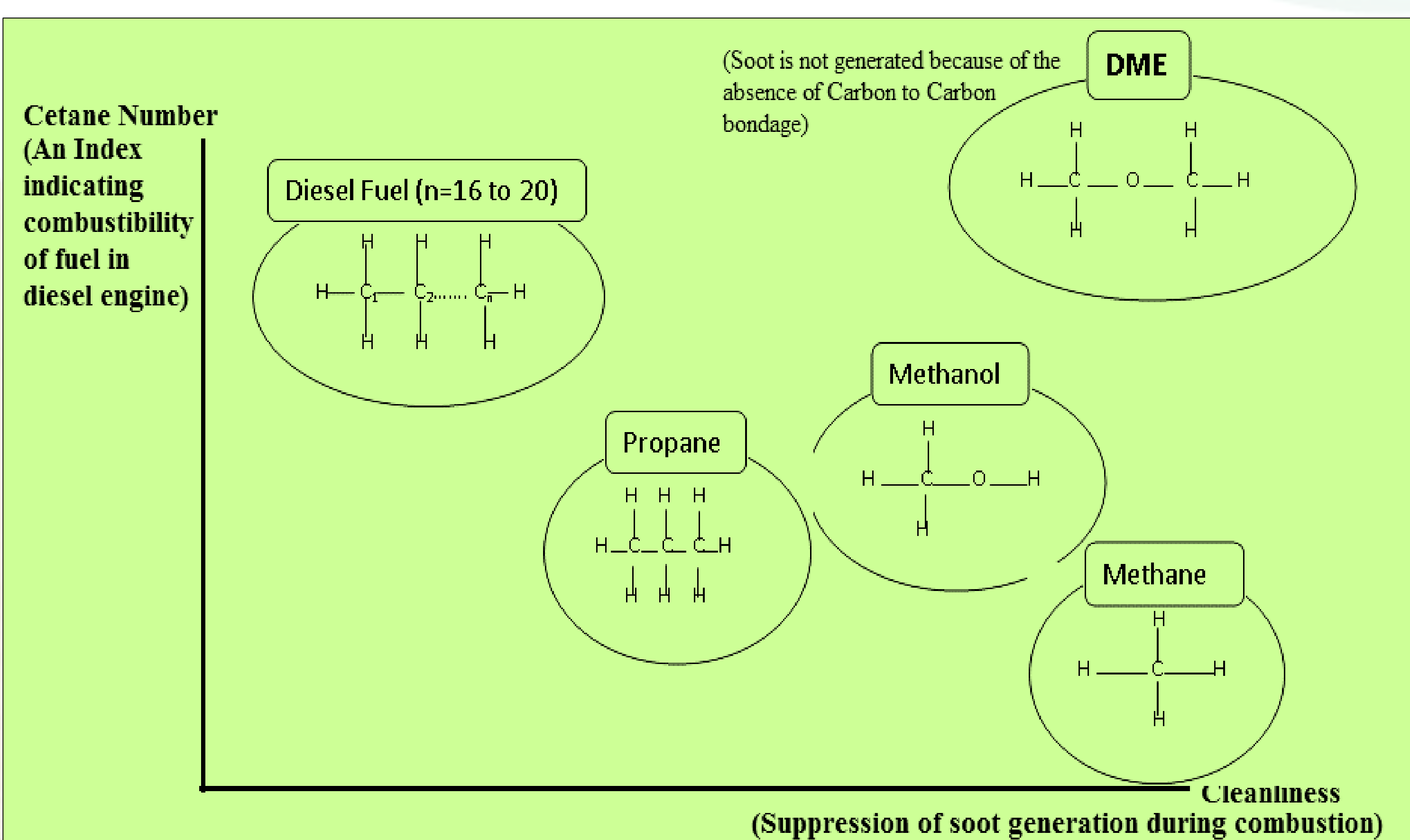
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Abstract

The main aim of this research work is to develop the technology to utilize Dimethyl Ether as fuel in an automotive diesel engine for achieving almost zero levels of smoke/particulate matter along with enhanced thermal efficiency.

Introduction

Dimethyl ether is a clean fuel if it is produced from the feedstock of coal; it can be green fuel when it is produced from biomass, agricultural and forestry waste. As DME fuel has higher ignition quality (cetane number: 58) than diesel, this fuel is more suitable for compression ignition engines/vehicles. Its very low boiling point and high evaporation pressure enables it to mix with air quickly to form a combustible mixture. DME structure is free of C-C bond and having high oxygen content (34.8%) helps in achieving very low smoke and PM emissions. The carbon to hydrogen ratio of DME ($\text{CH}_3\text{-O-CH}_3$) fuel is lower than diesel ($\text{C}_{16}\text{H}_{34}$) resulting in lower CO_2 emission which is one of the main green house gas emissions.



Conclusions

The developed technology would offer the following advantages:

- ❖ Zero level of smoke/particulate matter.
- ❖ Low NO_x emission
- ❖ Low CO_2 emission which is one of main Greenhouse gas emissions.
- ❖ The thermal efficiency of DME fueled engines are expected to be higher or nearly equal to diesel engines.

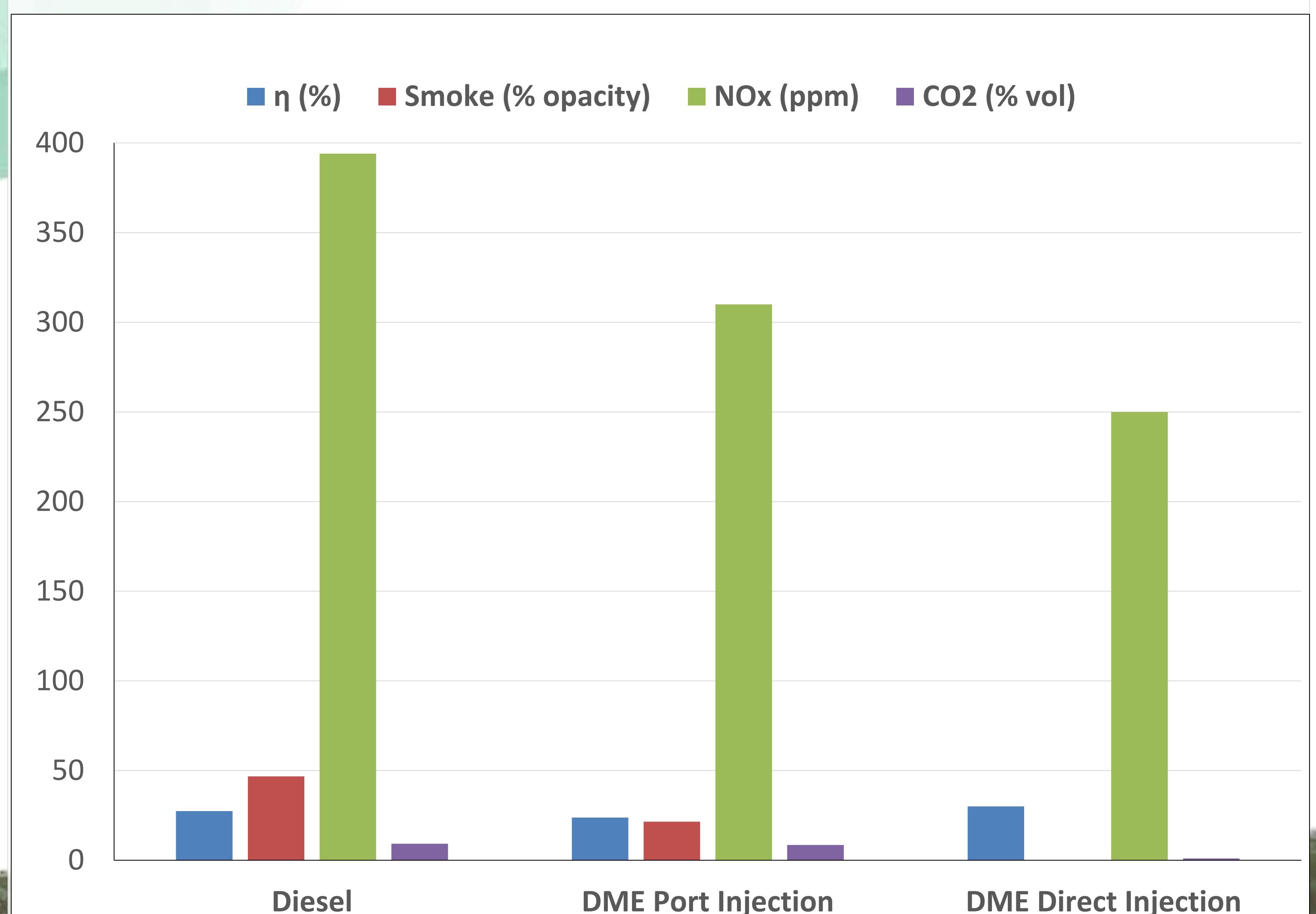
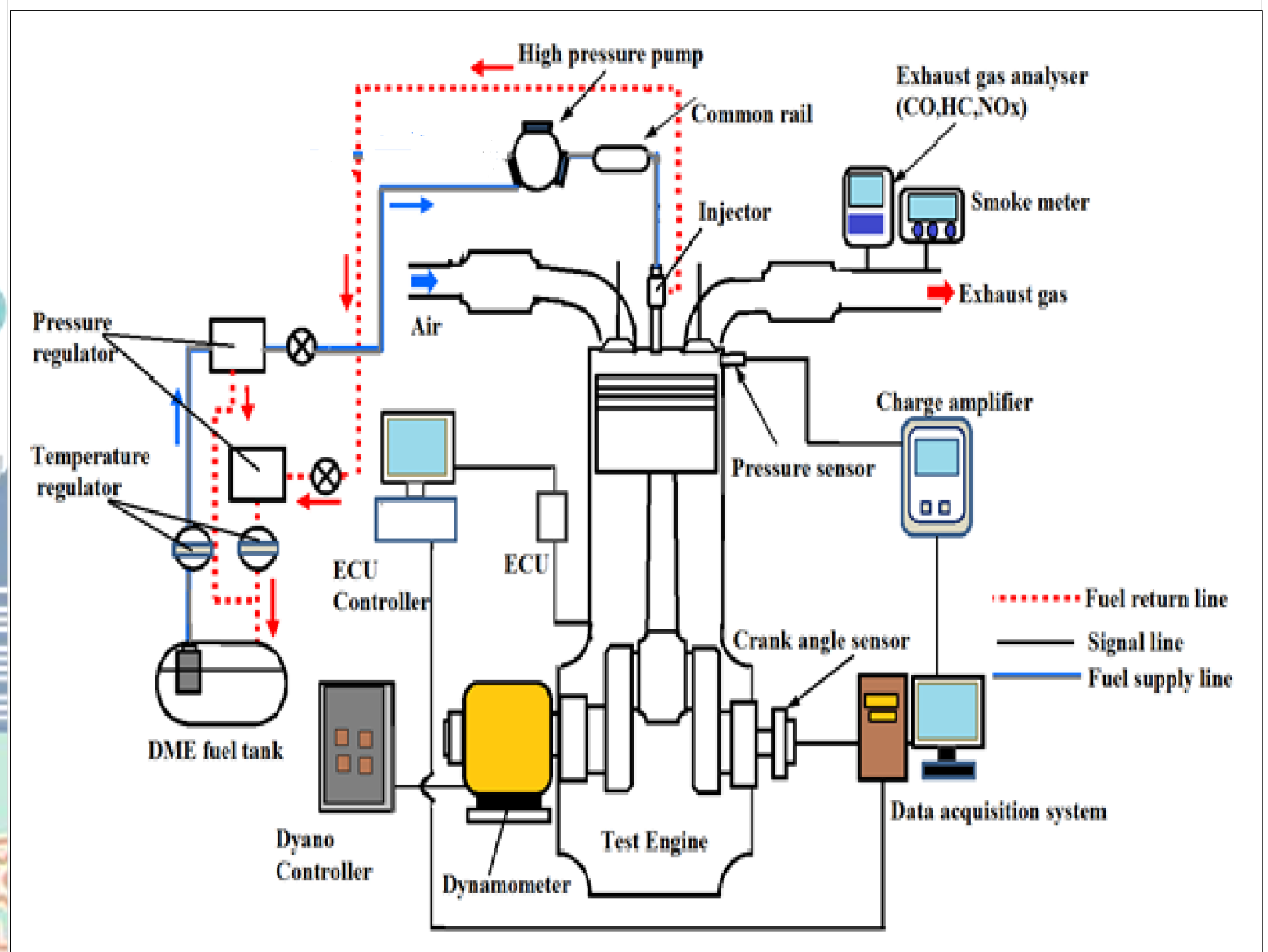
Industrial Significance

This research work will provide a methodology for development of a dedicated DME fuelled automotive compression ignition engine with better safety.

Technology Readiness Level

The engine is being tested with DME and indicates the desired results and TRL is 5.

DME fuelled direct injection CI engine



References

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