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Chapter 10

Low-Temperature Combustion Technologies for Emission Reduction in Diesel Engines

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Summary

Diesel engines are lean burn engines; hence CO and HC emissions do not occur in substantial amounts in diesel exhaust. The emissions of serious concern in compression ignition engines are particulate matter and nitrogen oxides because of elevated temperature conditions of combustion zone. Hence researchers have been striving continuously to lower the temperature of combustion in order to bring down the emissions of CI engines. This has been tried through premixed charge compression ignition, homogeneous charge compression ignition (HCCI), gasoline compression ignition and reactivity controlled compression ignition (RCCI). In this study, an attempt has been made to critically review the literature on low-temperature combustion conditions using various conventional and alternative fuels. Water-in-diesel emulsion technology has been discussed in detail. Most of the authors agree over the positive outcomes of water-diesel emulsion for both performance and emissions simultaneously. The problems and challenges augmented with the different strategies have also been described.

References

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