

Trans- and Supercritical Oxymethylene ether-3 injection and comparison with n-dodecane

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With the stricter limitations of pollutant emissions, operating pressure conditions in compression ignition engines are found to be well above the critical pressure of the pure injectants critical values in order to achieve a cleaner combustion and increase engine thermal efficiency.

In addition to that, alternative greener energy carrier are of interest. Particularly, oxygenated fuels such as Oxymethylene ethers are among the most considered thanks to their characteristics of being soot free and similar to their diesel fuels. Thus, they do not require drastic modifications to the combustion devices. In that context, studies of trans- and supercritical Oxymethylene ethers injection are carried out under diesel engines relevant conditions.

A fully compressible Eulerian homogeneous approach accounting for real fluids effects associated to high pressure conditions is used to investigate on the mixing behavior and spray characteristics.