EXPERIMENTAL DETERMINATION OF DOUBLE VIBE FUNCTION PARAMETERS IN DIESEL ENGINES WITH BIODIESEL

by

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A zero-dimensional, one zone model of engine cycle for steady-state regimes of engines and a simplified procedure for indicator diagrams analysis have been developed at the Laboratory for internal combustion engines, fuels and lubricants of the Faculty of Mechanical Engineering in Kragujevac. In addition to experimental research, thermodynamic modeling of working process of diesel engine with direct injection has been presented in this paper. The simplified procedure for indicator diagrams analysis has been applied, also. The basic problem, a selection of shape parameters of double Vibe function used for modeling the engine operation process, has been solved. The influence of biodiesel fuel and engine working regimes on the start of combustion, combustion duration and shape parameter of double Vibe was determined by a least square fit of experimental heat release curve.

Key words: *biodiesel, diesel engine, double Vibe, heat release curve*

Introduction

Diesel engine and biofuels

Half of all energy and raw material sources on our planet are practically engaged in production and exploitation of vehicles. The vehicles exist due to the same resources that all living beings depend on: soil, raw materials, water, air and space. Obviously, the vehicles have significant influence on human environment; hence a special attention must be given to them [1, 2].

Transport completely depends on oil supply and it is the source of important part of greenhouse gas emission. All predictions for the future have shown that the transport will increase and that it is important to find the solutions for secure fuel supply and the possibilities for pollution reduction. One of the solutions for these problems is the utilization of alternative fuels, which had been examined as possible fuels for spark ignition (SI) engines

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