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A SIMULATION STUDY ON THE DIESEL ENGINE COMBUSTION PROCESS BASED ON THE FIELD-EFFECT ANALYSIS METHOD OF COMBINED COMBUSTION

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Abstract

Based on the spray mixing field-effect analysis method, this paper has taken into consideration the variation in the distribution of oxygen concentration in the combustion process and has put forward the combined combustion field-effect analysis method. The method is applied to the matching study of a certain kind of diesel engine's combustion chamber with air admission and fuel injection parameters and can also be used to complete the simulation analysis and evaluation of mixing and combustion processes at total- and multi-dimensional levels. The results show that the best nozzle hole cone angle calculated by this method is 155°; the best nozzle hole number \times hole diameter of injector is $8 \times 0.27\text{mm}$, and the best swirl ratio is 1.0; the calculation results and experimental results are consistent. Therefore, the combined combustion field-effect analysis method can be used to carry out quantitative evaluation on the performance of a combustion system and it has instructive significance to the optimal matching and improvement of a combustion system.

Key words: air-fuel mixing, combustion system, diesel engine, field-effect analysis, simulation

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