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混合气质量对乙醇燃料**HCCI**燃烧特性的影响

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摘要 随着汽车工业的快速发展，能源短缺和环境污染问题变得越来越突出，
这促使人们努力探索提高发动机燃油经济性和降低尾气排放的新技术和新方法。HCCI燃烧作为一种新的燃烧方式，有较高的热效率和极低的NOx排放，
所以受到了国内外内燃机工作者的广泛关注。本文在一台改造的单缸HCCI发动机上以乙醇为燃料通过改变循环供油量和EGR的方法对HCCI燃烧的动力性，
经济性和排放性进行了研究。结果表明：乙醇燃料HCCI燃烧有较高的热效率，最高可以达到60％；最高IMEP为
0.6MPa；过量空气系数λ和EGR的合理组合可以有效控制HCCI燃烧的着火正时和NOx排放，但是EGR的加入使HC和CO排放增加。

关键词 乙醇；HCCI燃烧；废气再循环；排放

分类号

Influence of Mixture Quality on Homogeneous Charge Compression Ignition fueled with ethanol

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Abstract With the rapid development of automobile industry, new technologies for better engine fuel economy and lower exhaust emission are explored in terms of energy shortage and environment pollution. HCCI (Homogeneous Charge Compression Ignition) combustion is researched by the ICE(Internal Combustion Engine) researchers in the world with respect to its high heat efficiency and extremely low emission level. In this paper, the power output, fuel consumption and emission characteristics for a modified single-cylinder HCCI engine fueled with ethanol are discussed through the variable fuel supply quantity per cycle and EGR (Exhausted Gas Recirculation) rate. The results show that: the heat efficiency for HCCI combustion fueled with ethanol can reach to 60%; the highest IMEP(Indicated Mean Effective Pressure) was 0.6MPa; the proper excessive air ratio λ and EGR can effectively control the auto-ignition time and thus the NOx emission, but the EGR increased the HC and CO emission levels.

Key words Ethanol Homogeneous charge compression ignition(HCCI) Exhaust gas recirculation(EGR) Emissions

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