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贫油直喷三喷嘴模型燃烧室燃烧性能

Combustion performances of lean direct injection model combustor with three injectors

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中文关键词: [贫油直喷](#) [燃烧室](#) [燃烧性能](#) [蓝色火焰](#) [低排放](#)

英文关键词: [lean direct injection](#) [combustor](#) [combustion performance](#) [blue flame](#) [low emissions](#)

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中文摘要:

构建了反向双旋文氏管预混(CDV)三喷嘴矩形模型燃烧室,研究了其燃烧特征及性能.结果表明:火焰近乎全蓝色,类似气体的贫预混燃烧,且在此工况下,CO和NO_x换算成15%含氧量(体积分数)下排放的体积分数分别低于 10×10^{-6} 和 50×10^{-6} .此外,研究了进气温度变化对CDV三喷嘴污染物排放的影响,发现CO排放相对NO_x更易受到进气温度变化的影响,并分析揭示了产生该现象的原因.另外雾化器的性能极易影响贫油直喷火焰特征;需要改进雾化器的加工工艺以确保在预热工况下它能够保持持续稳定的良好雾化性能.

英文摘要:

A rectangular model combustor with three counter dual-swirl Venturi-premix (CDV) injectors was designed and its combustion characteristics and performances were also investigated. The results showed that, the combustion flames were blue, which were very similar to those of lean premixed gaseous combustion. And in the above-mentioned working condition, CO and NO_x emission volume fraction converted to 15 percent oxygen were less than 10×10^{-6} and 50×10^{-6} respectively. In addition, the effect of inlet air temperature change on pollutant emissions of these three CDV injectors was also investigated. It was found that the CO emission concentration was more affected by the change of inlet air temperatures than that of NO_x. And the reason about above-specified phenomenon was analyzed and revealed. Moreover, the study showed that, atomizer's performances greatly influenced the characteristics of lean direct injection combustion flames. Processing technology of the fuel atomizers should be improved to ensure long-term stability of their atomization performances.

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