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气气喷嘴推进剂入口温度对燃烧和壁温的影响

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Effects of propellants temperature in gas-gas injector inleton combustion performance and wall temperature

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摘要 以同轴双剪切气气单喷嘴为对象,对气气燃烧流场进行了数值模拟,并进行了研究,分析了喷嘴推进剂入口温度对燃烧性能和室壁温的影响,结果表明:推进剂温度变化引起的燃氧动量比变化对燃烧和壁温起主要影响;富氢燃气状态变化对燃烧和壁温的影响大于富氧燃气状态变化.试验验证了数值模拟结果.

关键词: 同轴双剪切喷嘴 燃烧性能 壁温 数值模拟 试验

Abstract: A combustor with a shear tricoaxial gas-gas injector was researched numerically and experimentally. The influence of propellants temperature in the injector inlet on the combustion performance and wall temperature was investigated and analyzed. The numerical simulation results show that the variable momentum ratio of fuel to oxidizer which brought by the variable propellants temperature is the main factor. The influence of the fuel temperature on the combustion performance and wall temperature is more obviously than the oxidizer temperature. The experimental results validate the numerical simulation results.

Keywords: shear tricoaxial injector combustion performance wall temperature numerical simulation experiment

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