

脉宽调制型喷头电磁阀内流动数值模拟

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摘要: 脉宽调制型喷头广泛用于变量喷雾中, 其流量的变化主要通过电磁阀在一定时间内开启和闭合来实现的, 利用CFD软件对电磁阀内部流动进行数值模拟, 研究电磁阀内的流动特征。结果表明, 电磁阀开启瞬间出口处会形成负压, 产生气体回流, 延时期会有倒吸气体排放, 影响雾化质量, 同样关闭延时期也会产生雾化不完整的情况。电磁阀开启状态时, 出口压力等于入口压力, 当刚开启和关闭时, 流量和压力达到峰值。另外在电磁阀刚开启和闭合过程中, 伴随有涡旋运动的产生、发展和输运的复杂过程。A modulated spraying nozzle control system can be used for variable rate chemical application. The transient numerical simulation of high speed valve was modeled by CFD software Fluent to research the flowing character in the solenoid valve. The result showed that there was suction pressure generated at outlet of valve when it just opened, which would result in air-sucking and effect atomization quality, also at lapse in the shut down time of the valve, it was harmful for the atomization. When the valve was opening, the pressure of outlet was equal to that of inlet, when it was just opening, both the pressure and flow rate met the maximal level, with two zones increased sharply. The forming, developing and transporting complex process of vortex was found during the valve opening and closing.

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