

“V”型无阀压电泵的流阻特性 Property of Flow Resistance for Piezoelectric Pump with “V”-shape Tube

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关键词: 压电泵 “V”型管 流阻特性 有限元法

摘要: 基于扩散/渐缩管流动特性, 提出一种用于无阀压电泵的“V”型管, 以满足微型全分析系统等应用需求。阐述了“V”型无阀压电泵的结构, 对“V”型无阀压电泵内的流阻特性进行理论分析。通过采用有限元法对“V”型管进行模拟计算, 研究“V”型管的结构参数对其流阻特性的影响。研究表明: “V”型管的分流角、扩散角以及进口宽度对其流阻特性影响较大, “V”型管的长度对其流阻特性影响较小; 较大的“V”型管深度有利于提高泵的效
率。 Based on the flow characteristics of diffuser/nozzle used in valve-less piezoelectric pump, a new type of “V”-shape tube was presented for micro total analysis systems. The structure and flow property of the valveless piezoelectric pump with “V”-shape tube was analyzed. Finite element method was applied to simulate the flow in the “V”-shape tube for the flow characteristics. And the ANSYS was employed to analyze numerically the effects of the “V”-shape tube structure on the flow resistance property. The results show that, compared with the splitter angle, diffuser angle and the inlet width of “V”-shape tube, the effect of the length of the “V”-shape tube on the flow resistance property is smaller. And a large depth benefits to improve the pump efficiency.

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