

反应堆工程

组合阀流动阻力实验研究与数值模拟

蔡伟, 薄涵亮, 秦本科

清华大学 核能与新能源技术研究院, 北京 100084

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摘要 组合阀流动阻力是控制棒水压驱动系统设计的关键参数之一。对改进后的新阀进行实验研究, 获得了各流道差压、流量、阻力系数和流量系数等关键数据。利用计算流体力学软件CFX进行数值模拟, 分析了雷诺数 Re 对流动阻力的影响。在此基础上, 拟合得到了阻力系数的经验公式, 为驱动系统优化设计和理论分析提供了实验基础和理论依据。

关键词 [控制棒水压驱动系统](#) [组合阀](#) [流动阻力](#) [数值模拟](#)

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Experimental Research and Numerical Simulation on Flow Resistance of Integrated Valve

CAI Wei, BO Han-liang, QIN Ben-ke

Institute of Nuclear and New Energy Technology, Tsinghua University, Beijing 100084, China

Abstract The flow resistance of the integrated valve is one of the key parameters for the design of the control rod hydraulic drive system (CRHDS). Experimental research on the improved new integrated valve was performed, and the key data such as pressure difference, volume flow, resistance coefficient and flow coefficient of each flow channel were obtained. With the computational fluid dynamics software CFX, numerical simulation was executed to analyze the effect of Re on the flow resistance. On the basis of experimental and numerical results, fitting empirical formulas of resistance coefficient were obtained, which provide experimental and theoretical foundations for CRHDS's optimized design and theoretical analysis.

Key words [control rod hydraulic drive system](#) [integrated valve](#) [flow resistance](#) [numerical simulation](#)

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