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陶瓷过滤器脉冲反吹系统的流场的数值模拟

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摘要　In the commercial utilization of rigid ceramic filters, the performance of pulse cleaning has crucial effects on the long-term stable operation. In order to get a clear insight into the nature of this cleaning process and provide a solid basis for industrial applications, the flow in ceramic candle filter was investigated. The flow in the pulse-jet space and inside the ceramic candle is regarded as two- dimensional, unsteady, compressible flow, and numerical simulation is carried out by computational fluid dynamics. The numerical predictions of flow field are in good agreement with the experimental measurements. Effects of the candle diameter, the separation distance between the nozzle and the candle injector and the length of the candle on the flowfield have been numerically analyzed to provide the basis for the optimum design of the pulse cleaning system.

关键词　numerical simulation　unsteady flowfield　ceramic candle　pulse cleaning

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Numerical Analysis of Flow Field in Ceramic Filter During Pulse Cleaning

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Abstract　In the commercial utilization of rigid ceramic filters, the performance of pulse cleaning has crucial effects on the long-term stable operation. In order to get a clear insight into the nature of this cleaning process and provide a solid basis for industrial applications, the flow in ceramic candle filter was investigated. The flow in the pulse-jet space and inside the ceramic candle is regarded as two- dimensional, unsteady, compressible flow, and numerical simulation is carried out by computational fluid dynamics. The numerical predictions of flow field are in good agreement with the experimental measurements. Effects of the candle diameter, the separation distance between the nozzle and the candle injector and the length of the candle on the flowfield have been numerically analyzed to provide the basis for the optimum design of the pulse cleaning system.

Key words　numerical simulation; unsteady flowfield; ceramic candle; pulse cleaning

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