

脉动燃烧干燥换热特性分析与实验 Analysis and Experiment of Heat Transfer in Helmholtz Pulse Combustion Dryer

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关键词: 干燥 脉动燃烧 对流换热系数 努塞尔数 脉动频率

摘要: 利用Helmholtz型脉动燃烧器,进行了脉动气流与黄铜球间的对流换热实验,应用集总热容法确定了不同频率脉动气流与黄铜间的对流换热系数,探究了脉动频率对脉动燃烧干燥过程中气流与物料间对流换热系数的影响,建立了努塞尔数与脉动频率间的关联式,并对耐火土颗粒在脉动燃烧气流中的干燥过程进行了预测,实验结果与预测值吻合较好。 In order to further understand the heat transfer characteristics of pulse combustion drying process, a Helmholtz type pulsing burner was used to carry out heat transfer experiments. Through a convective heat-transfer experiment between pulsing air and brass ball by the method of lumped heat capacity, the convective heat-transfer coefficient in different frequencies pulse air was determined, and the impact of pulse frequency on the convective heat-transfer coefficient between material and airflow was investigated, the criterion correlation between Nu and pulse frequency was also established. By using the established correlation, the drying process of the refractory clay particles in the pulse combustion was forecasted. Compared with the experimental value, the results showed that the predicted values and the experimental results matched well.

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