

真空冷冻干燥过程参数对升华干燥能耗影响的组合试验研究

Combined experimental study on the effects of the operational parameters on energy consumption of sublimation-drying during vacuum freeze-drying

投稿时间: 2003-8-26 最后修改时间: 2004-3-5

稿件编号: 20040442

中文关键词: 真空冷冻干燥; 过程参数; 能耗; 试验研究

英文关键词: vacuum freeze-drying; operational parameters; energy consumption of freeze-drying; experimental study

基金项目: 山西省科技攻关项目(项目编号: 012119)

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摘要点击次数: 21

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中文摘要:

介绍了真空冷冻干燥过程参数对冻干能耗影响的试验研究, 主要进行了对冻干过程影响显著的物料厚度、干燥室压强和加热板温度3个过程参数的二次正交回归组合试验和分析。得到这3个主要影响因素在其它二因素取5个不同水平时对升华干燥时间和干燥能耗的影响曲线和分析结果, 表明影响冻干过程能耗的主次因素依次为: 冻干物料厚度、加热板温度、干燥室压强, 以及冻干时间和冻干能耗与这3个因素按二次规律变化, 且变化规律具有明显的一致性。

英文摘要:

The experimental study on the relationship between the operational parameters and the energy consumption during vacuum freeze-drying was carried out. In this paper, through analyzing the effects of the three main influential parameters, i.e. material thickness, pressure of drying chamber and heating temperature, on the sublimation drying time and energy consumption, the parameters of drying time, energy consumption of sublimation drying curves were obtained under five different levels of the other two. The results indicate that the quadratic law which has apparent consistence exists in the relationships above. In addition, the important sequence of the three factors is as follows: material thickness, heating temperature and pressure of drying chamber on vacuum freeze drying.

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