

Heat Pump Dryers Using HCFC 22 and HFC 134a As Refrigerants

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Abstract

The performance of heat pump dryers using single circuit of HCFC 22 refrigerant and double circuits of HFC 134a refrigerant were investigated. Evaporating temperatures rang from 0-20 °C and condensing temperatures from 45-60°C were considered as operating conditions in the theoretical analysis. The theoretical results showed that the heating effect, pressure ratio, and coefficient of performance of heat pump using HFC 134a refrigerant are close to those of heat pump using HCFC 22 refrigerant when the evaporating temperature is increased or the condensing temperature is decreased. In the experiments, bean sprout and bananas were dried by using both heat pump dryers. To maintain the physical properties of the products, the drying air temperature should be controlled. The heat pump dryer using double circuits of HFC 134a refrigerant showed a good potential to reduce input energy especially during the period when drying air temperature is higher than a setting point.

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