

仓内谷物通风干燥孔道网络数值模拟与验证 Pore Network Numerical Simulation and Experiment on Drying of Corn Material in Bin

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摘要: 利用前已建立的仓内谷物通风干燥孔道网络模型,对玉米热风干燥实验过程进行了数值模拟,并将模拟结果与实验数据进行了比较。结果表明:该模型可有效模拟谷物的干燥过程;干燥时玉米颗粒平均温度与玉米堆孔隙气相平均温度之间存在明显的差别,后者始终比前者温度要高,故以往将谷物与孔隙气相温度不加区分,视为同一值的做法是不妥的;配位数对干燥的影响十分显著,其值越大,物料干燥越快;当物料含杂、配位数值较小时,干燥仓内会出现“湿团”现象。In order to validate the model of reference, a corn drying experimental study was conducted, and numerical simulation was carried out under the same environmental condition. The experiment and simulation results indicated that the pore network model could explain the drying process of corn material well. There was a significant difference between the temperature of corn and of pore air, hence it was unreasonable to confuse the two kinds of temperature. The pore coordination number had a great effect on the drying process. The greater the pore coordination number was, the faster the material was dried. When the pore coordination number was small, a wet cluster phenomenon appeared in the drying bin.

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