

番茄果实热导率测试装置参数实验 Optimization of the Parameters of Designed Apparatus for Determination of Thermal Conductivity of Tomato Fruits

张敏 钟志友 赵惠忠 张雷杰 杨乐 刘艳玲

上海海洋大学

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摘要: 微热探针法测试热导率系统已被广泛应用于食品材料热导率的测试中。但是, 由于实验条件或实验设备的限制, 基于理想的线热源瞬态模型测量原理得到的结果会产生某些测试误差。针对测试误差, 从探针输入电压、加热时间和样品的径向尺寸等装置操作参数的选择着手, 通过实验, 得到装置系统测定中输入电压的最佳值为2.5~6.5V、加热时间最佳值为20~50s。最后通过实际测试, 得到了番茄果实不同成熟阶段的热导率变化规律。The thermal conductivity probe system has been used in food. However, since the probe system is derived from an idealized transient heat transfer model, there are inevitable differences between the real probe and the theoretical model. The test error resulted by some experimental operating parameters including input voltage, heating time of thermal probe and size of sample was studied. The best values of input voltage, heating time of thermal probe and size of sample were obtained to minimize the test error. The optimal value for input voltage of thermal probe is in the range of 2.5~6.5V, and the optimal heating time of thermal probe is in the range of 20~50s. And then the thermal conductivities of tomato fruits at different ripeness stage were measured. The experimental data can give a reference for storage and process of tomato industry.

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