基于BP神经网络的果蔬热导率预测模型 Prediction Model of Thermal Conductivities of Fruits and Vegetables Based on BP Neural Networks

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关键词： 果蔬 热导率 BP神经网络 预测模型

摘 要： 通过微热探针法测试装置研究了30个品种的果蔬热导率与可溶性固形物含量、含水率、密度和硬度等因素的变化关系，提出了一种基于BP神经网络的果蔬热导率预测模型，并根据误差比较分析进行了模型优化。结果表明，该优化网络模型具有较好的热导率预测效果，平均相对误差为1.11%，平均绝对误差为0.005 7 W/(m?K)，可以用于果蔬贮藏加工业中果蔬热传递过程的计算。 The relationships between thermal conductivities and soluble solid contents, water contents, temperature, density and hardness of 30 types fruits and vegetables were studied by the tepid probe test system. A BP artificial neural network model was presented and optimized for the prediction of thermal conductivities of fruits and vegetables according to the error analysis. The result showed that the optimal model was able to predict thermal conductivity with a mean relative error of 1.11%, a mean absolute error of 0.0057 W/(m?K). The model can be incorporated in heat transfer calculations during fruits and vegetables processing.

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