Title Electrical impedance spectroscopy investigation on cucumber dehydration

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Abstract

The electrical impedance parameters of cucumber during cucumber drying procedure were studied with a Solartron™ Impedance/Gain-phase Analyzer, which has a sweeping frequency range from 100 Hz to 1 MHz. Two non-destructive electrodes, the 3M Red Dot surface adhesive gel electrodes, were attached symmetrically along the circumferential direction of samples. It was found that the impedance properties changed with the different moisture content. The magnitude of impedance decreased when moisture dropped from 95 to 68.05% after 210 min. drying. And the diameter of the impedance arc as shown in the Nyquist Plot also reflects the moisture content variations. A comparison study for three different electrical models, Hayden model, double-shell model and distributed model, is also carried out. The results of Chi-squared value and the weighted SS show the distributed model is the best model for characterising cucumber impedance characteristics.