

Title Moisture desorption isotherms of seeds having mucilage coating
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Abstract

In order to better understand the dependence of thermodynamic and equilibrium moisture properties on the seed superficial structure, the desorption isotherms and heat of vapourisation (L_s) of mucilaginous and non-mucilaginous papaya seeds were investigated and compared. Equilibrium moisture (M_{eq}) data were determined at five temperatures (25, 30, 40, 45, and 50 °C) and relative humidities ranging from 0.111 to 0.842 using the static gravimetric method. Results revealed that air relative humidity (RH), temperature and seed superficial structure affected the sorption isotherms. At higher RH values, M_{eq} was higher in papaya seeds with mucilage than in papaya seeds without mucilage. The effect of mucilage coating decreased with increase in temperature and decrease in RH. The Guggenheim–Anderson–de Boer model was used to represent and to explain the moisture desorption behaviour of papaya seeds. The coefficient of determination, standard error of estimate, mean relative percent deviation and the nature of residual plots were used to evaluate the goodness-of-fit. From thermodynamic analysis of desorption isotherms, L_s values were calculated, providing a comprehension of the energy requirements associated with the moisture desorption of seeds having distinct superficial structures. The equations obtained for predicting M_{eq} and L_s are useful in simulation models for dryer design for papaya seeds.