

Title Effective water diffusivity during air drying of pretreated tropical fruits
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Abstract

Tropical fruits have short self-life, therefore the processing represents an alternative to avoid post-harvest losses. Air drying is one of the most applied process in fruits, and the osmotic pre-treatment increase the flavor properties of dried fruits. The drying process design a requires the knowledge of water diffusivity in the fruits. Our objective was to determine the influence of solids added by osmotic drying in effective water diffusivity in tropical fruits air-drying. Papaya, mango, pineapple and banana samples with 0.012 m thickness were pre dried in two osmotic solutions: 60% sucrose and 40-20 % sucrose- chili, by 16 h. Latter the samples were dried with air at 303 and 313 K and 2.5, m-s-1. Drying kinetics were obtained by weigh losses. Experimental kinetics were fit to analytical solution of mass transfer equation in ID in order to evaluate water diffusivity. Water diffusivities between $3.71E-10$ and $4.10E-10m^2-s^{-1}$ were obtained for non- pretreated samples at 303 K and 313 K respectively. The osmotically pretreated samples produces water diffusivities between $2.46E-10$ and $2.79E-10 m^2-s^{-1}$. Water diffusivity was a temperature and initial solids contents function. No difference was found between sucrose and sucrose- chili pre-treated samples. The water diffusivities founded have utility in the drying simulation and optimization of the fruits reported, in order to allows us to understand the evolution of the process and predict it.