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State diagrams of candied orange peel obtained using different hypertonic solutions

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ABSTRACT

~~In the present work s~~State diagrams were established for the candied orange peel obtained by saturation with ~~the~~ sucrose or glucose-fructose syrup. ~~The d~~Differential scanning calorimetry was used to determine the freezing points and glass transition temperatures in order to generate freezing curve and glass transition curve. Curves were modelled by the Chen and Gordon-Taylor equations. ~~plot the freezing curve (Chen equation) and glass transition curve (Gordon-Taylor equation) as well as to establish parameters corresponding to the maximal freeze concentration (T_m', T_g', and X_s').~~ Maximal freeze concentration parameters ~~The~~ (X_w', T_m' and T_g') ~~values~~ were determined from ~~the~~ state diagrams ~~were from~~ in the 0.185 to 0.218 kg water/kg sample; ~~from~~ -36.9 to -34.8°C; and ~~from~~ – 54.6 to -53.3ºC range.~~, respectively. They a~~All values depended on the ~~individual sugar (~~glucose, fructose, sucrose, and maltose~~)~~ content. ~~in the products examined. The results obtained for the o~~Orange peel candied with 100% sucrose syrup showed that the glass transition curve can ~~be used to~~ predict ~~a phenomenon of~~ sugar crystallization ~~associated with an increase in moisture content in~~ when the product moisture content increases. The dependence ~~found~~ between the T_g value and moisture content can be used to control the transformations occurring during storage of ~~the~~ products containing amorphous sugars. The glucose-fructose syrup applied during candying ~~(already at 30% proportion) had reduced completely the~~ prevented sucrose recrystallization.

Keywords: Candied orange peel, State diagram, Freezing curve, Glass transition, Freezable water

1. Introduction