

Drying kinetics and sorption isotherms of cornelian cherry fruits

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ABSTRACT

In this study, drying kinetics and sorption isotherms of cornelian cherry fruit are investigated under various drying air conditions. Experiments are conducted in a lab-scale convective drier under the following drying conditions: temperatures at 25, 30, 40, 50 and 60°C; velocities at 0.3, 0.6 and 0.9 m/s; relative humidity values at 25%, 40%, 55% and 70%. Sorption isotherms of the dried cornelian cherry fruit are determined for different temperatures and water activity values at first. At a given water activity, the results show that the equilibrium moisture content decreases with increase in temperature. The experimental sorption curves are then described by the GAB, Oswin, Smith and Halsey models. A nonlinear regression analysis method was used to evaluate the constants of the sorption equations. The GAB model was found to be suitable for describing the sorption curves. Later, drying experiments are conducted for various values for drying air. The experimental moisture data were fitted to some models available in the literature, mainly the Henderson and Pabis model, the Lewis model and the two-term exponential model, and a good agreement was observed.

Keywords: Convective air drying; Cornelian cherry fruit; Drying kinetics; Sorption isotherm

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