Title Drying kinetics of red delicious apple

Author A. Kaya, O. Aydın and C. DemirtaŞ

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Abstract

Drying kinetics of apple slices were investigated experimentally for varying values of the drying air parameters including temperature, velocity and relative humidity. Experiments were conducted using air temperatures at 35, 45 and 55 °C, velocities at 0·2, 0·4 and 0·6 m s^{-1} and relative humidity values at 40%, 55% and 70%. The experimental moisture data were fitted to some models available in the literature, mainly the Henderson and Pabis model, the Newton model and the two-term exponential model, and a good agreement was observed. In the ranges selected, the values of the moisture diffusivity D_{eff} were obtained between $0{\cdot}483\times10^{-10}$ and $2{\cdot}019\times10^{-10}$ m^2 s^{-1} from Fick's diffusion model. Using D_{eff} for the activation energy, the value E_a was determined assuming the Arrhenius-type temperature relationship, which varied from 19·957 to 22·624 kJ mol^{-1}. The sorption isotherms of the dried apple slices were determined at a different temperature.