Osmotic Dehydration Kinetic of Potato

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Osmotic dehydration (OD) is one of the fruit and vegetable preservation technologies with potential application in developing countries due to the low power consumption, the simplicity of the process and the low cost of its osmotic agents. The OD consists of immersing the product in aqueous solution of high osmotic pressure. The objective was the study of the OD kinetic of potato pieces in sucrose solutions at different concentrations in the rank of (10- 50% m/m) and the same salt concentration (10% m/m). The potatoes were cut into 1 cm cubes and the solution was kept at 30°C and was shaken at 120-130 rpm with a solution mass to potatoes mass ratio of 4. In order to model the kinetics, empirical models like those of Azuara and Raoult Wack were applied. The experimental values of water loss after 4 hours of treatment were compared with the obtained with these models at infinite time. These results were very similar in spite of not to have reached the equilibrium at 4 hours. The values of water loss at infinite time obtained with the model of Azuara and the Raoult-Wack were very similar and they fit the experimental data very satisfactorily. Also a phenomenological model was used, Crank model, that represents the diffusional mechanism based on the second Fick's law. The effective diffusion coefficient of water in the product for the different sucrose concentrations was calculated. The values were in the rank of \((5.7 \pm 0.35 - 17.4 \pm 1.80) \times 10^{-10} \text{ m}^2/\text{s}\).