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BOOK OF ABSTRACTS

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CHALLENGING FOOD ENGINEERING AS A DRIVER TOWARDS SUSTAINABLE FOOD PROCESSING

UNIVERSITY OF ALGARVE, GAMBELAS CAMPUS

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“Challenging Food Engineering as a Driver Towards Sustainable Food Processing”

e-Book of Abstracts

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Drying kinetics and mass transfer properties for the drying of thistle flower

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Because the drying of thistle flower is important due to its utilization as curd coagulant in *Serra da Estrela* cheese production, this work intended to study the drying process of thistle flower, by comparing the convective drying at constant temperature with the natural drying with variable temperature. For that, the natural drying process was monitored as to the evolution of water loss along time and different experiments were conducted for the convective drying with air at 0.5 m/s at different temperatures (between 35 and 65 °C). The kinetic data were fitted to different thin layer models from literature and also to the Fick's second law of diffusion. Also the mass transfer correlations were used to compute the mass transfer properties. The results obtained indicated that the different thin layer models tested fitted well the experimental data, with values of R between 0.972 and 0.999, but with slightly best results if using the Modified Page model (lowest value of R equal to 0.997). The values of the moisture diffusion and mass transfer coefficients in all cases were found to increase with increasing temperature of the drying air, from 35 to 65 °C. The values of diffusivity increased from 1.902×10^{-10} to 1.300×10^{-9} m²/s and the values of the mass transfer coefficient increased from 5.731×10^{-9} to 8.049×10^{-8} m/s. The values of activation energy for moisture diffusion and for mass transfer were found to be 56.48 kJ/mol and 77.66 kJ/mol, respectively.

Keywords: Activation energy, Convective drying, Diffusivity, Mass transfer coefficient