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Dimensioning of a Solar Dryer with Application of an Experiment Design Method for Drying Food Products

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Abstract : The purpose of this study is an application of experiment design method for dimensioning of a solar drying system. NIMROD software was used to build up the matrix of experiments and to analyze the results. The software has the advantages of being easy to use and consists of a forced way, with some choices about the number and range of variation of the parameters, and the desired polynomial shape. The first design of experiments performed concern the drying with constant input characteristics of the hot air in the dryer and a second design of experiments in which the drying chamber is coupled with a solar collector. The first design of experiments allows us to study the influence of various parameters and get the studied answers in a polynomial form. The correspondence between the polynomial thus determined, and the model results were good. The results of the polynomials of the second design of experiments and those of the model are worse than the results in the case of drying with constant input conditions. This is due to the strong link between all the input parameters, especially, the surface of the sensor and the drying chamber, and the mass of the product.

Keywords : solar drying, experiment design method, NIMROD, mint leaves
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