عنوان مقاله:

Factorial technique to predict drying rate in microwave drying process

محل انتشار:

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خلاصه مقاله:

In the present work, microwave drying was used to dehydrating of Solanum Tuberosum (potato) samples to evaluate the effect of various parameters that can influence on the drying rate of samples. Required samples were cut and dried in different conditions (as per design matrix). During dehydration, samples were withdrawn at regular intervals until the samples showed constant weights. Moisture contents and moisture ratios were computed from related equations and then drying constants (k) in "Henderson and Pabis" equation were calculated from the linear regression on linear portions of the curves using SPSS software. A mathematical model then, was developed using factorial technique to predict the drying constant. The response factor, namely, drying constant, as affected by microwave power, sample diameter and sample thickness has been investigated and analysed. Analysis of variance (ANOVA), F-test and student's t-test were employed to determine and check the significance and adequacy of the developed model. The modelling equation verified the experimental results and proved to be an important tool in predicting the drying rate under different drying conditions. The model indicated that microwave power levels and sample diameter are the most important parameters. Also, there are interactions between microwave power, sample diameter and sample thickness so developed. The predicted results and trends of important interactions between different parameters have been presented in graphical forms.

کلمات کلیدی:

Mathematical modelling, Factorial design, Microwave drying, Potato

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