ABSTRACT

Pleurotus florida variety of freshly harvested mushrooms was used for determination of different physical properties (bulk density, true density, porosity, water activity, and colour) and thermal properties (specific heat and thermal conductivity) as a function of various independent process variables e.g. moisture content, temperature, and bulk density. Out of the six different methods of blanching and five different levels of blanching time tried, steam blanching with 3 min time was found to be the best method yielding minimum percent blanching losses and inactivating colour changing enzymes. The chemical treatment conditions were optimized by using response surface methodology and were found as – concentration of KMS solution, 0.76%; concentration of CA solution, 0.38%; and soaking time in chemical solutions, 8.06 minutes. Hot-air drying characteristics of untreated and treated mushrooms were evaluated at three different drying air temperatures (40, 55, 70°C) with and without recirculation of drying air. Detailed analysis of drying curves enabled the estimation of different heat and mass transfer coefficients and diffusivity during constant drying rate period and estimation of effective moisture diffusivity and activation energy during falling drying rate period. The quality of dehydrated mushrooms was evaluated in terms of various rehydration and colour parameters as a function of different independent process variables. Drying the treated mushrooms with 55°C drying air temperature without recirculation of drying air and rehydrating the dried product in boiling water (100°C) for 30 minutes, produced good quality product with minimum colour change and maximum rehydration performance. Out of the four isotherm equations tested, the Guggenheim-Anderson-deBoer (GAB) equation was found to be the best to predict EMC of dehydrated mushrooms under different environments of varying temperature and relative humidity during adsorption process.