

Abstract

The effect of ethyl oleate on the drying rates for corn was investigated in a pilot plant air-dryer. Corn was air dried in controlled mention the drying conditions without treatment or after dipping in a cold solution of ethyl oleate. Dipping in a solution of 2% (w/w) ethyl oleate and 4% (w/w) potassium carbonate (AEEO) resulted, in most cases, in an increase in the drying rate of corn kernels. The Hunter colour scale parameters (lightness, redness and yellowness) were measured to quantify the colour changes. The shorter drying times and best quality dried product were obtained with corn kernels dipped in the solution of ethyl oleate. The single exponential equation and the Page equation were used to determine the thin-layer drying characteristics. Both the equations fitted well to the experimental data. The Page equation was found to better describe the thin-layer drying of corn than the single exponential equation. The effective diffusivity was determined to be 9.488×10^{-11} to $1.768 \times 10^{-10} \text{ m}^2/\text{s}$ for the untreated corn and 1.424×10^{-10} to $2.716 \times 10^{-10} \text{ m}^2/\text{s}$ for treated samples in the temperature range of 55–75 °C. The activation energies for diffusion were calculated to be 29.56 kJ/kg mol (for untreated) and 30.56 kJ/kg mol (for treated).