

Kinetic and thermodynamic characteristics of seaweed dried in the convective air drier

Abstract

This study reveals the drying kinetics, specific heat and enthalpy of seaweed dried in the convective air drier. Comparison between convective hot air and sun drying process was also studied. At 50°C air temperature with 23.45 percent relative humidity and 1.55 ms⁻¹air flow rate, it has been found that the moisture removal required 4 hours to reach moisture content of 19.66 percent wet basis with its drying rate at 0.28×10^{-3} kg water h⁻¹. The data of drying rate showed that the drying process took place in the falling rate period. The specific heat and initial enthalpy were found to be 1.3842 kJkg⁻¹°C⁻¹ and 1672.69 kJkg⁻¹, respectively. It was observed that the drying kinetics, specific heat, and enthalpy values vary significantly as functions of air temperature which seem to have more effect when compared to air flow rate and seaweed loading. Hence, the best method for seaweed drying was to use convective air system rather than sun drying because it required less drying time and has better drying efficiency. © 2010 Berkeley Electronic Press. All rights reserved.