Thesis Title   Electrical Conductivity Property of Foods for Ohmic Heating Application

Thesis Credits   12

Candidate   Mr. Adisak Sukprasert

Supervisors   Assoc. Prof. Dr. Suvit Tia

     Dr. Sailom Sampanvejsobha

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Department   Food Engineering

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Abstract

Ohmic heating is a food processing operation in which heat is internally generated within foods suddenly and uniformly by the passage of alternating electric current. Ohmic heating can be applied for thermal food processing, especially, suitable for particulate food. The electrical conductivity meters for liquid and solid foods were designed and fabricated in this study, and both of them showed good precision and accuracy between 25-90 ^{0}C. The measured of electrical conductivity of both liquid and solid food sample can be correlated as a linear function of temperature. Moreover, the field strength, electrical conductivity, particle orientation, particle shape and size, and solid fraction significantly effect the heating rate of particulate food.

Semi-empirical equations were developed to predict the ratio of heating rate between the solid food particles and the surrounded liquid food by considering the effect of solid fraction and the ratio of electrical conductivity of solid to liquid foods. The predicted result was in good agreement compared with experimental data. The purposed equation also showed more reasonable prediction when the solid food particle was vegetable than meat.

Keywords : Ohmic Heating / Electrical Conductivity / Particulate Food