

Complex permittivity and moisture measurements of oil palm fruits using an open-ended coaxial sensor

ABSTRACT

An open-ended coaxial sensor for the determination of complex permittivity and moisture content of oil palm fruits is presented in this paper. The measurement system consisting of the sensor and a PC-controlled vector network analyzer have been tested successfully on a range of oil palm fruits of various degrees of ripeness. The initial values of the complex permittivity were estimated using the admittance model of the sensor. The amount of moisture content was found by matching the values of permittivity from the quasistatic model with the permittivity of a dielectric mixture model using the moisture content values obtained from the standard oven drying method. © 2005 IEEE.

Keyword: Coaxial sensor; Microwave; Moisture content; Network analyzer; Permittivity