

A simple rectangular microstrip technique for determination of moisture content in Hevea rubber latex

ABSTRACT

A simple rectangular microstrip sensor for determination of moisture content in Hevea Rubber Latex is presented in this paper. The microstrip patch sensor was designed to operate at microwave frequency range from 1 to 5 GHz on a RT/Duroid substrate with 6.15 ± 0.015 permittivity and 1.27 mm thickness. The width and length of the rectangular patch antenna was 18 mm and 38 mm, respectively. The reflection coefficient of the sensor loaded with Hevea latex at various percentages of moisture content from approximately 36.1% to 88.6 %. Calibration equations have been established between moisture content and phase of reflection coefficient at several selected frequencies. These equations were used to predict the amount of moisture content on Hevea latex based on the measured reflection coefficient values. The actual values of moisture content were obtained using standard oven drying method. The lowest mean relative error between actual and predicted moisture contents was 0.04 at 1 GHz.

Keyword: Microstrip sensor; Moisture content; Reflection coefficient; Hevea rubber latex