

Dielectric characterization of ethanol and sugar aqueous solutions for potential halal authentication

Abstract

A potential method for detection and discrimination of alcoholic containing drinks for halal authentication using dielectric properties has been investigated. Behaviors of several concentrations of ethanol solutions in water were studied for verification purpose. The addition of three types of sugar namely sucrose, glucose and fructose show the effect and changes to dielectric properties of solutions. Dielectric constant and dielectric loss factor for each samples were measured over the microwave frequency from 0.5 to 50 GHz. The results showed that dielectric properties manage to discriminate alcohol content until the lowest concentration studied of 0.5% in water mixture. Beyond this limit, solution is considered as alcoholic drinks.

Keyword: Alcohol; Dielectric; Halal authentication; Sugar effect