

Surface plasmon resonance characterization of virgin coconut oil biodiesel: detection of iron corrosion using polypyrrole chitosan sensing layer

ABSTRACT

Surface plasmon resonance was applied to the study of the optical properties of virgin coconut oil biodiesel produced by the mixture of virgin coconut oil and methanol. Experimentally, the refractive indices of the mixture and dispersion curve were determined, and we found that the resonance angle and refractive index depend on the volume percentage of oil. In addition, a polypyrrole-chitosan layer was used to detect iron ions generated because of the corrosiveness of virgin coconut oil biodiesel. The accuracy of the sensor was 0.1 ppm for the detection of iron ions.

Keyword: Biodiesel; Corrosion; Dispersion; Fe(III); PPy-CHI; Spr sensor; Virgin coconut oil