Surface plasmon resonance study on the characteristics of a conducting polymer ultra-thin film

ABSTRACT

The optical properties of an ultra-thin conducting polymer film was investigated using surface plasmon resonance (SPR) reflectometry system consisting of 2 mW He-Ne 632.8nm solid state laser. Real part of the complex permittivity decreases with thickness, but remains between 2.0-3.0 for films thicker than 30 nm. Exposure to HCl vapour is expected to increase conductivity. Shifting and shallowing of SPR curves with the length of exposure to HCl exhibit increase in conducting properties.

Keyword: Conducting polymer; Surface plasmon resonance; Polyaniline; Thin film; Permittivity