Humidity sensor based on silver nanoparticles embedded in a polymeric coating

Pedro J. Rivero, Aitor Urrutia, Javier Goicoechea, Francisco J. Arregui, Ignacio R. Matías
Electric and Electronic Engineering Department
Public University of Navarra, Campus Arrosadia
Pamplona, Spain
E-mail: pedrojose.rivero@unavarra.es

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Abstract- In this work, it is presented a novel optical fiber humidity sensor based on silver nanoparticle-loaded polymeric coatings built onto an optical fiber core. The polymeric film was fabricated using the Layer-by-Layer assembly technique. The silver nanoparticles (Ag NPs) were characterized using transmission electron microscopy (TEM and UV-VIS spectroscopy. A Localized Surface Plasmon Resonance (LSPR) attenuation band is observed when the thickness of the coating increases, and showed a very good sensitivity to Relative Humidity (RH) variations, suitable for high performance applications such as human breathing monitoring.

Index terms*:* Optical fiber, humidity sensor, surface Plasmon resonance (SPR), synthesis of silver nanoparticles, polymeric coating.