

nanoparticles [59]. This type of sensors was presented for the first time based on two types of resonances which were the localized surface plasmon resonance and the lossy mode resonance. The sensor showed a sensitivity of 0.943/RH% to humidity changes.

The structure of long period fiber gratings was presented by Li *et al.* for the purpose of refractive index measurement [60]. Two different polyelectrolyte films were deposited on the structure for the aim of comparison which were PAH/PSS and PDDA/PSS. The effect of coating the films on the transmission spectrum of the long period fiber grating was carried out by exposing the sensor to different organic solvents. Moreover, the detected sensitivities for solvents in the case of the long period grating deposited with PDDA/PSS were higher than those obtained by the one deposited with PAH/PSS film because they have a higher swelling degree when they are immersed in the organic solvents. A long period fiber grating sensor for the measurement of the refractive index of sucrose was introduced by Li *et al.* [61]. The sensor was based on the PAH/PSS polymeric coating and the sensing mechanism was based on the detection of the shift in the wavelength resonance. The effect of the number of layers on the sensitivity of the sensor to the surrounding medium refractive index was examined theoretically and experimentally. The experimental results showed that different film thicknesses resulted in different wavelength shifts. For example, when the long period fiber grating was coated with 100 bilayers, it showed a wavelength shift higher than the one obtained by coating 115 bilayers.