Opto-Electronics Review, 2016, volume 24, issue 4, pp. 209-215

D-shape polymer optical fibres for surface plasmon resonance sensing

Gasior, K.; Martynkien, T.; Wojcik, G.; Mergo, P.; Urbanczyk, W.

DOI: https://doi.org/10.1515/oere-2016-0025

Abstract:

We experimentally studied three different D-shape polymer optical fibres with an exposed core for their applications as surface plasmon resonance sensors. The first one was a conventional D-shape fibre with no microstructure while in two others the fibre core was surrounded by two rings of air holes. In one of the microstructured fibres we introduced special absorbing inclusions placed outside the microstructure to attenuate leaky modes. We compared the performance of the surface plasmon resonance sensors based on the three fibres. We showed that the fibre bending enhances the resonance in all investigated fibres. The measured sensitivity of about 610 nm/RIUfor the refractive index of glycerol solution around 1.350 is similar in all fabricated sensors. However, the spectral width of the resonance curve is significantly lower for the fibre with inclusions suppressing the leaky modes.