Nanoimprint Fabrication of Hybrid Polymer Microring Resonators Operating at Very Near Infrared Wavelengths

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The motivation of our work was to fabricate using a new low cost method, large area of polymer microring resonators with a minimum number of process steps operating in the very-near infrared region (900 nm). Our optimized fabrication method results in generation of high-quality devices with Q factors up to 39 000 and finesses up to $F \sim 14$. Most of the earlier studies described in the literature considering polymer-based photonic devices characterization and applications have been focused at infrared wavelengths. However, there is an urgent challenge and demand for the development of polymer photonic based devices closer to/or at visible wavelengths, taking into account that the absorption of water is about two thousand times lower in the visible range than in near infrared regions and that lower cost light sources are available in this range. Because of this, it is expected that our fabricated structures have high potential for biosensing applications.

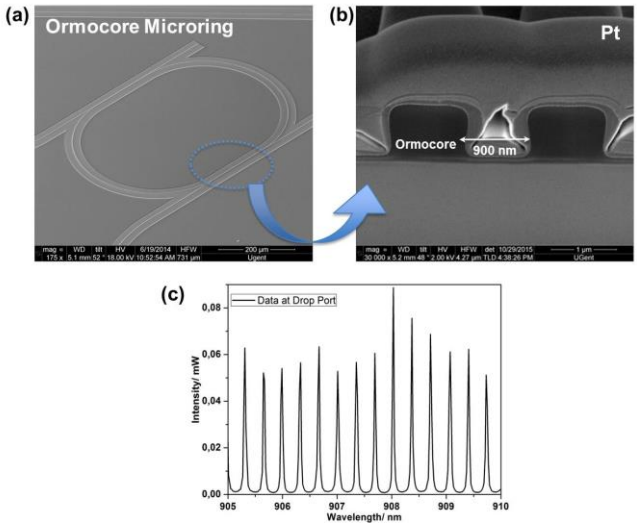

Fig. 1. (a) SEM image of the fabricated microring resonator (MR). (b) A FIB cross-section in the gap region of the imprinted Ormocore MR and the optical transmission spectrum of this structure measured at the drop port.