

High Magnification Polymeric Lens for Smartphone Microscope and SPR Sensor Chip

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The fabrication of polymeric Plano-convex micro lens using high reflective optical polymer (Polydimethylsiloxane, PDMS by Dow Corning and Norland Optical adhesive 61, NOA61 by Norland Products) is presented. Confined sessile drop is a modified technique that uses for the fabrication of Plano-convex micro lenses.¹ Lens substrates were invented with PDMS films which had thickness of 0.5-0.7 mm and it was drilled with several diameter sizes by a hollow holder puncher (3-8 mm). Liquid polymer droplets were formed on lens substrates, and were precisely controlled under Gibb inequality condition. The substrates were also controlled in the size and curvature (focal length and magnification) by volume of Liquid polymers. The Plano-convex micro lenses were characterized based on the quality of the fabricated lenses (resolution and contrast percentage) with imaging of USAF 1951 target. The fabricated plano-convex micro lenses were used to convert a smartphone into a smartphone microscope. Furthermore, the fabrication of the Kretschmann surface plasmon sensor could be achieved by modification of polymeric plano-convex micro lenses enabling the design of low cost SPR sensors.²

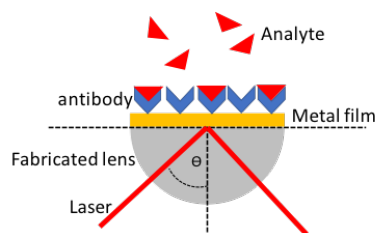


Fig.1 The Kretschmann surface plasmon resonance sensor fabricated by polymeric plano-convex micro lenses

Reference

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