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New Processes for the Development of Polymer Optical Waveguides

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There has been strong demand for the development of polymer optical waveguides because they have a high potential to be applied as optical devices for high bandwidth optical network systems. Fabrication method of polymer optical waveguides are very simple and cost effective. Polymers are also easy to functionalize where high speed optical switching and signal modulation can be attained. In this presentation, such several simple fabrication methods will be introduced. The use of soft-lithography instead of standard photolithography and dry etching technologies is attractive because inexpensive optical device can be realized. Polymerization using multi-photon absorption of materials is also a good method for optical waveguide fabrication. Laser induced self-writing technology of optical waveguide is also very simple and attractive. Using these processes, we can fabricate and interconnect multiple optical circuits at once. We have also developed new methods to evaluate these polymer optical waveguides. These technologies are very effective to develop excellent polymer optical waveguides that will match to applications such as next generation fiber to the home systems.