

Fabrication and mechanical properties of air core polymer photonic crystal fibers

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Abstract

Polymer based photonic crystal fibers with low cost manufacturability, and the mechanical and chemical flexibility offer key advantages over traditional silica based photonic crystal fibers. PMMA based air core photonic crystal fiber was fabricated by stacking an array of PMMA capillaries to form a preform, and followed by fusing and drawing into fiber with a draw tower. The air core guiding phenomena was observed in air-core PMMA photonic crystal fiber. The ultimate tensile strength of PMMA photonic crystal fiber increases with the increase of the air-hole fraction. The mechanical strengths of all the microstructured optical fibers are higher than those of traditional PMMA fibers.

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polymer