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Tittle

Near-Net Shaping of Single-Crystal Silicon for Optical Lens by One-Shot Pressing at Temperature Just below Silicon Melting Point and Its Demonstration of Optical Properties

Source

APPLIED PHYSICS EXPRESS vol.4 no.10 106501 DOI: 10.1143/APEX.4.106501 oct 2011 Abstract

Silicon is brittle and easily cracks even under a small load. The difficulty in shaping silicon has prevented breakthroughs in the mass production of silicon lenses for terahertz and infrared technology. We developed a novel method of deforming bulk single-crystal silicon into the required shape by one-shot pressing and realized the near-net shaping of silicon into a plano-convex shape with the curvature radius R 7: 5 mm. The crystallographic quality of the obtained lens was improved by primary recrystallization. By packaging it into a practical sensor module, the suitability of the lens for practical application was demonstrated. (C) 2011 The Japan Society of Applied Physics.