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Abstract:We develop a fluorinated phenyl-tolane based nematic mixture NJU-LDn-4 and evaluate its frequency-dependent birefringence utilizing terahertz time domain spectroscopy (THz-TDS). A large mean birefringence of 0.306 is obtained in a broad range from 0.4 to 1.6 THz, with a maximum of 0.314 at 1.6 THz. Furthermore, relation between molecular structures and birefringence property is discussed. This work reveals new insights for tailing liquid crystal molecules with desirable large birefringence in THz range, which is extremely meaningful for the design and fabrication of fast, compact and tunable terahertz devices. © 2012 Optical Society of America.
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