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Accession number:12996538
Title:Thin chalcogenide capillaries as efficient waveguides from mid-infrared to terahertz
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Source title:Journal of the Optical Society of America B (Optical Physics)
Abbreviated source title:J. Opt. Soc. Am. B, Opt. Phys. (USA)
Volume:29
Issue:8
Publication date:Aug. 2012
Pages:2116-23
Language:English
ISSN:0740-3224
CODEN:JOBPDE
Document type:Journal article (JA)
Publisher:Optical Society of America
Country of publication:USA
Material Identity Number:CN50-2012-004
Abstract:We show that chalcogenide glass As:₃₈Se₆₂ capillaries can act as efficient waveguides in the whole midinfrared-terahertz (THz) spectral range. The capillaries are fabricated using a double crucible drawing technique. This technique allows to produce glass capillaries with wall thicknesses in the range of 12 to 130 μm. Such capillaries show low-loss guidance in the whole mid-IR-THz spectral range. We demonstrate experimentally that low-loss guidance with thin capillaries involves various guidance mechanisms, including Funnel reflections at the capillary inner walls, resonant guidance (ARROW type) due to light interference in the thin capillary walls, as well as total internal reflection guidance where very thin capillary walls act as a subwavelength waveguide, which is especially easy to observe in the THz spectral range.
Number of references:33
Inspec controlled terms:arsenic compounds - chalcogenide glasses - infrared spectra - optical fabrication - optical waveguides
Uncontrolled terms:thin chalcogenide capillaries - optical waveguides - mid-infrared waveguides - terahertz waveguides - chalcogenide glass - double crucible drawing technique - low-loss guidance - funnel reflections - capillary inner walls - resonant guidance - ARROW type - total internal reflection guidance - size 12 mum to 130 mum - $As_{38}Se_{62}$
Inspec classification codes:A4280L Optical waveguides and couplers - A4285D Optical fabrication, surface grinding - A7865M Optical properties of amorphous and glassy semiconductors and insulators (thin films/low-dimensional structures) - B4130 Optical waveguides
Numerical data indexing:size 1.2E-05 1.3E-04 m
Chemical indexing:As38Se62/bin Se62/bin As38/bin As/bin Se/bin
Treatment:Experimental (EXP)
Discipline:Physics (A); Electrical/Electronic engineering (B)
DOI:10.1364/JOSAB.29.002116

Database:Inspec
IPC Code:G02B6/10