
CANCELED - Nanocrystal-Doped Glass Ceramic Fibers: Novel Near/Mid-Infrared fiber laser materials

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Abstract

Fiber amplifiers and tunable fiber lasers working in near (NIR, 1.0~1.7 μ m) and middle infrared (MIR, 2~5 μ m) regions are being extensively investigated owing to their various potential applications in optical telecommunication, environmental monitoring, remote sensing and so forth.[1,2] PbS quantum dot (QD) doped glass fiber with tunable broadband NIR emission and rare-earth-ion (such as Er³⁺) doped glass ceramic fiber with enhanced MIR emission are well suitable for the above-described applications. Importantly, novel "melt-in-tube" method is developed to solve the key bottleneck problem of uncontrollable rapid growth of QDs or nanocrystals existing in traditional fiber-drawing technique.[3,4] Furthermore, thermal and optical properties between fiber core and cladding glass are well matched, which ensure that the structure of the precursor fiber is well preserved during the fiber-drawing process. The excellent spectroscopic characteristics and well-preserved structure suggest that the obtained glass fiber may be a promising material for fiber amplifiers and tunable fiber lasers.

References

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