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Ag nanoparticles embedded $\text{Er}^{3+}/\text{Yb}^{3+}$ co-doped phosphate glass single-mode fibers

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ABSTRACT:

An enhanced 1.53 μm fluorescence was observed in $\text{Er}^{3+}/\text{Yb}^{3+}$ co-doped phosphate glass containing Ag nanoparticles (NPs). Then Ag NPs embedded $\text{Er}^{3+}/\text{Yb}^{3+}$ co-doped phosphate glass single-mode fibers were successfully drawn by using the conventional rod-in-tube technique. A 54 mW single-frequency fiber laser operated at 1.53 μm was built by using a 1.8-cm-long as-drawn fiber. To the best of our knowledge, this is the first time that a 1.53 μm single-frequency fiber laser has been realized with a short piece of $\text{Er}^{3+}/\text{Yb}^{3+}$ co-doped phosphate glass single-mode fiber containing Ag NPs.

Keywords

Ag NPs; $\text{Er}^{3+}/\text{Yb}^{3+}$ co-doped; Phosphate glass; Single-mode fibers; 1.53 μm laser

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