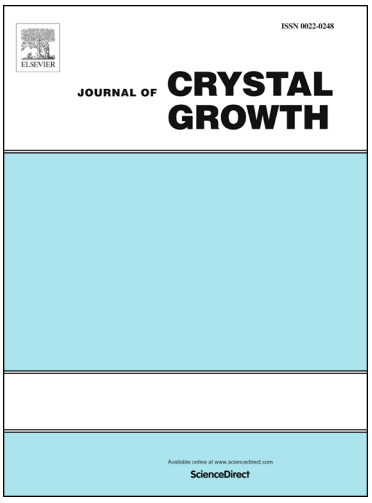

Formation and optical properties of Tm,Yb-codoped ZnO nanowires grown by sputtering-assisted metalorganic chemical vapor deposition

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Formation and optical properties of Tm,Yb-codoped ZnO nanowires grown by sputtering-assisted metalorganic chemical vapor deposition

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Abstract

We report the formation and the optical properties of Tm,Yb-codoped ZnO nanowires (NWs) grown by sputtering-assisted metalorganic chemical vapor deposition. The growth conditions of the ZnO core NWs are optimized by changing the growth temperature and the VI/II ratio. The optimal conditions are elucidated via structural analysis by scanning electron microscopy, X-ray diffractometry, and optical characterization. The ZnO:Tm,Yb/ZnO core-shell NWs are formed by growing ZnO:Tm,Yb shells on optimized ZnO core NWs. Light emission originating from the highest $^1G_4$-$^3H_6$ transitions from Tm^{3+} ions is observed around 490 nm in ZnO:Tm,Yb/ZnO NWs due to the improved crystal quality of the ZnO host by utilizing the NW configuration.

Keywords: A3. Metalorganic vapor phase epitaxy; B2. Semiconductor III-V materials;

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