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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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