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

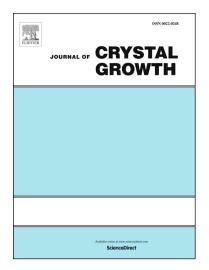
J. Tatebayashi, G. Yoshii, T. Nakajima, M. Mishina, Y. Fujiwara

PII: S0022-0248(18)30423-8

DOI: https://doi.org/10.1016/j.jcrysgro.2018.09.006

Reference: CRYS 24730

To appear in: Journal of Crystal Growth



Please cite this article as: J. Tatebayashi, G. Yoshii, T. Nakajima, M. Mishina, Y. Fujiwara, Formation and optical properties of Tm, Yb-codoped ZnO nanowires grown by sputtering-assisted metalorganic chemical vapor deposition, *Journal of Crystal Growth* (2018), doi: https://doi.org/10.1016/j.jcrysgro.2018.09.006

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### **ACCEPTED MANUSCRIPT**

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

J. Tatebayashi<sup>a</sup>, G. Yoshii, T. Nakajima, M. Mishina and Y. Fujiwara

Department of Materials and Manufacturing Science, Graduate School of Engineering,

Osaka University, 2-1 Yamadaoka, Suita, Osaka, 565-0871, JAPAN

#### **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;

<sup>&</sup>lt;sup>a</sup> E-mail: tatebaya@mat.eng.osaka-u.ac.jp

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