

09

Color change upconversion mechanism of $Y_6O_5F_8 : Er_{3+}/Yb^{3+}$ microtubes by using time-resolve spectra *

© S. Wang, X.H. Cheng, J.Y. Wang, Z.C. Zhong

Hubei Key Laboratory of Low Dimensional Optoelectronic Materials and Devices, Hubei University of Arts and Science, Xiangyang 441053, Hubei Province, People's Republic of China
E-mail: wangsong1984@126.com

(Received October 19, 2017)

The mechanism of the upconversion processes in $Y_6O_5F_8 : 2\%Er^{3+}/X\%Yb^{3+}$ ($X = 3, 10, 20$) microtubes has been explored. The luminescent properties of the as prepared sample is investigated by utilizing up-/downconversion, decay and time resolve spectra. The results indicate that the red and green emission are clearly competitive depending on the Yb^{3+} concentration. High Yb^{3+} concentration induces the enhancement of the energy-back-transfer (EBT), process, which leads to the quenching of green emission and enhances the red emission. So it is possible to utilize the temporal evolutions of emission bands to deeply understand the color change UC mechanisms.

DOI: 10.21883/FTT.2018.07.46125.294

* Полный текст статьи опубликован в журнале „Physics of the Solid State“ (Т. 60. Вып. 7).