厦门理工学院研究生科技活动月——成果展示

Novel red emitting $LnTaO_4$: Eu^{3+} (Ln = La, Y) phosphors for warm white LEDs

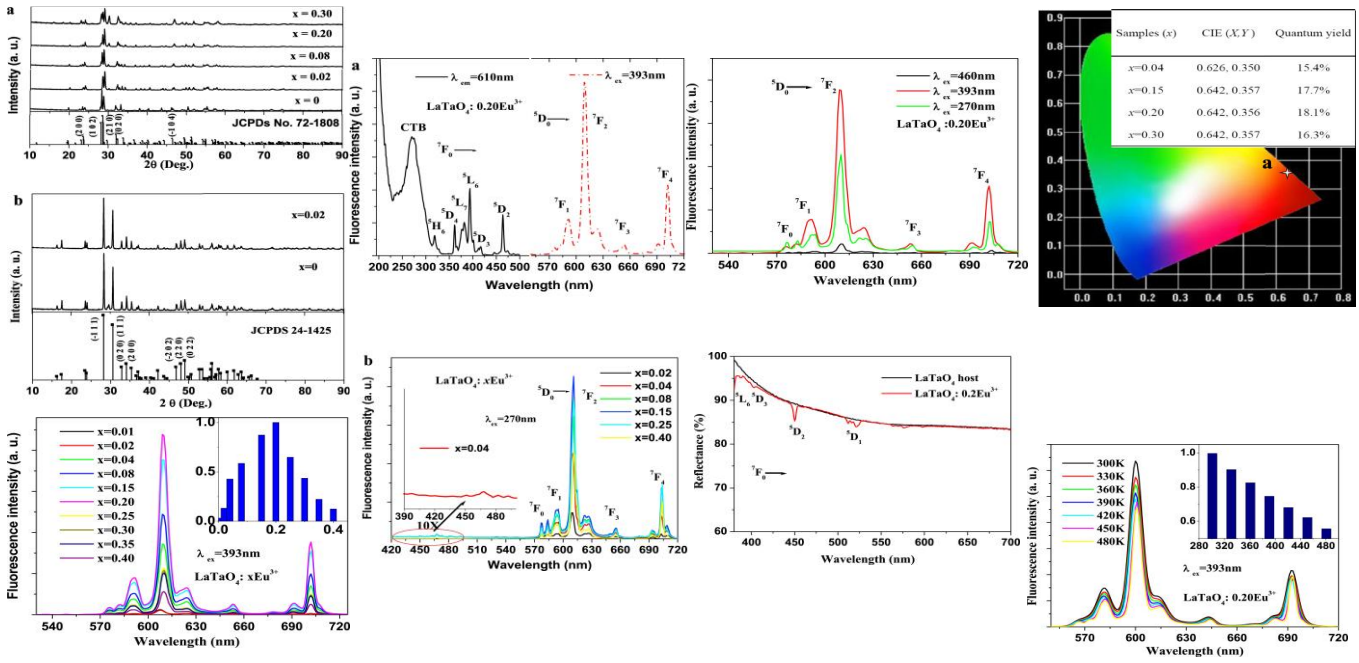
一. 成果完成人及所在单位： 陈浩，光电与通信工程学院　　指导教师：熊飞兵

二. 成果简介：

$LnTaO_4$: Eu^{3+} (Ln = La, Y) phosphors were synthesized by high-temperature solid-state reaction. Powder X-ray diffraction analysis confirmed the pure phase formation. Diffuse reflection spectra, excitation and emission spectra, the CIE chromaticity coordinates as well as the temperature-dependent emission spectra were investigated those phosphors.， results suggested that $LnTaO_4$: Eu^{3+} (Ln = La, Y) as red emitting phosphors could be potential candidates for white LEDs.

三. 主要研究内容及创新点：

Eu^{3+}-activated $LaTa_{1-x}Eu_xO_4$ (x = 0–0.40) and $YTa_{1-x}Eu_xO_4$ (x = 0–0.20) were successfully synthesized. Those phosphors exhibit intense red emission at 610 nm due to the electric dipole $^5D_0 \rightarrow {}^7F_2$ transition upon the excitation at 270, 393 and 460 nm, and the emission intensity of LaTaO4: Eu3þphosphor is much stronger than that of $YTaO_4$: Eu^{3+}. For $LaTaO_4$: xEu^{3+}(x = 0–0.40) phosphor, the optimum concentration is about x = 0.20 and fluorescence concentration quenching mechanism is the electric dipole-dipole interaction. Furthermore, the critical transfer distance is 0.926 nm in $LaTaO_4$: Eu^{3+} phosphor. $LaTaO_4$: Eu^{3+} exhibits moderate thermal-stability. Therefore, $LnTaO_4$: Eu^{3+} (Ln = La, Y) as novel pure red-emitting phosphors are expected to have great potential in white LEDs.



四. 主要研究成果及应用情况

本成果已被 **SCI 录用，检索号：**000517950500024

Novel red emitting $LnTaO_4$: Eu^{3+} （Ln = La, Y） phosphors for warm white LEDs[J]. Physica B: Condensed Matter. 2020, 582: 411981.

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