Научный совет по оптике и лазерной физике Российской академии наук
Научный совет по люминесценции Российской академии наук
Совет научной молодежи ИНЦ СО РАН
Иркутский филиал Института лазерной физики СО РАН
Институт геохимии СО РАН
Иркутский государственный университет
Иркутский научный центр СО РАН

XV Международная молодежная конференция по

ЛЮМИНЕСЦЕНЦИИ И ЛАЗЕРНОЙ ФИЗИКЕ

Село Аршан, Республика Бурятия, Россия,
18–24 июля, 2016 г.

Тезисы лекций и докладов

Иркутск – 2016 г.

CYCLIC MICROWAVE-MODIFIED SOL-GEL SYNTHESIS OF $SrY_2(MoO_4)_4:Er^{3+}/Yb^{3+}$ PARTICLES AND THEIR UPCONVERSION PHOTOLUMINESCENCE PROPERTIES

Chang Sung Lim[1], V.V. Atuchin[2,3,4]

[1]Department of Advanced Materials Science & Engineering, Hanseo University, Seosan 356-706, Republic of Korea, E-mail: cslim@hanseo.ac.kr
[2]Laboratory of Optical Materials and Structures, Institute of Semiconductor Physics, SB RAS, Novosibirsk 630090, Russia
[3]Functional Electronics Laboratory, Tomsk State University, Tomsk 634050, Russia
[4]Laboratory of Semiconductor and Dielectric Materials, Novosibirsk State University, Novosibirsk 630090, Russia. E-mail: atuchin@isp.nsc.ru

The photoluminescence particles have evolved in their applications, such as fluorescent lamps, cathode ray tubes, solid-state laser, amplifiers for fiber optics communication and new optoelectronic devices, which show high luminescence quantum yields, since usually more than one metastable excited state exists, multiple emissions are observed. Rare earth activated upconversion (UC) particles can convert near infrared radiation of low energy into visible radiation of high energy. The co-doped Yb^{3+} ion and Er^{3+} ion can remarkably enhance the UC efficiency from infrared to visible light due to the efficiency energy transfer from Yb^{3+} to Er^{3+}. In this study, $SrY_2(MoO_4)_4:Er^{3+}/Yb^{3+}$ phosphors with the doping concentrations of Er^{3+} and Yb^{3+} (Er^{3+} = 0.05, 0.1, 0.2 and Yb^{3+}= 0.2, 0.45) were synthesized by a cyclic microwave-modified sol-gel method for the first time. The samples were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), and energy-dispersive X-ray spectroscopy (EDS). The optical properties were examined using photoluminescence (PL) emission and Raman spectroscopy.