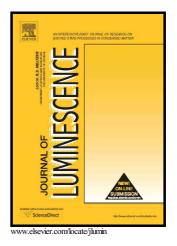
Author's Accepted Manuscript

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 PII:
 S0022-2313(15)00651-1

 DOI:
 http://dx.doi.org/10.1016/j.jlumin.2015.10.074

 Reference:
 LUMIN13697

To appear in: Journal of Luminescence

Received date:16 May 2015Revised date:21 October 2015Accepted date:30 October 2015

Cite this article as: V.S. Levushkina, D.A. Spassky, E.M. Aleksanyan, M.G. Brik, M.S. Tretyakova, B.I. Zadneprovski and A.N. Belsky, Bandgar engineering of the $Lu_xY_{1-x}PO_4$ mixed crystals, *Journal of Luminescence* http://dx.doi.org/10.1016/j.jlumin.2015.10.074

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ACCEPTED MANUSCRIPT

Bandgap engineering of the Lu_xY_{1-x}PO₄ mixed crystals

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Keywords: mixed crystals, LuPO₄, YPO₄, thermostimulated luminescence, ab-initio calculation, bandgap engineering

Abstract

Bandgap modification of the $Lu_xY_{1-x}PO_4$ mixed crystals has been studied by thermostimulated luminescence (TSL) and ab-initio calculation methods. Doping of Lu_xY_1 . _xPO₄ with Ce³⁺ allowed to follow up the changes of electron traps depth, caused by the modification of the bottom of conduction band. The observed gradual shift of the most intensive TSL peaks to higher temperatures with increase of **x** value was connected with the high-energy shift of the conduction band bottom. According to the band structure calculations the bottom of the conduction band is formed by the 5d and 4d states of Lu and Y, respectively. Therefore, substitution of one cation by another is responsible for the observed variation of the electronic and optical properties. Doping with Eu³⁺ was used to study the Download English Version:

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