SEMINAR ANNOUNCEMENT

Tunable luminescence of rare earth doped some yttrium-based phosphors and their applicability to technology

Prof. Nurdogan Can
Professor of Physics
Jazan University

Wednesday, 14 Oct 2015, 11-12 PM, ROOM No. 2308

Cerium and terbium activated white emitting yttrium silicate phosphor ($Y_{2-x-y}Ce_xTb_ySiO_5$) having average size between 96-123 nm were synthesized by a gel-combustion, and their phase and crystal structures, morphologies and ultraviolet (UV)-visible spectroscopic properties were studied. All rare earth doped yttrium silicate (YSO) phosphors are well crystallized powders containing only monoclinic X2-Y_2SiO_5 phase. No significant changes in the cell parameters were observed with increasing of Tb amount as ionic radii of Tb^{3+} (0.923 Å) and Y^{3+} (0.9 Å) have almost the same. Under different excitations, YSO:Ce^{3+}exhibits blue emission due to the 5d-4f transitions of Ce^{3+} ions. The series of emission states at different wavelengths of YSO:Tb^{3+} associated to *f-f* transition of Tb^{3+} ion were detected from luminescence measurements. The emission observed at 544 nm (green) corresponding to $^5D_4 \rightarrow {}^7F_5$ of Tb^{3+} is strongest one. Incorporation of variable amounts of Tb^{3+} in the YSO host lattice, determines the modification of emission colour from blue through light blue and eventually to bluish green. A possible energy transfer mechanism taking place from Ce^{3+} to Tb^{3+} was also discussed in terms of excitation and emission spectra.

Organized by

Physics Department, Faculty of Science, Jazan University

http://colleges.jazanu.edu.sa/sites/en/sci/physics/