Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Boosting quantum efficiency of single layer organic light emitting device by doping CoFe magnetic nanoparticles.[1] CHENGJUN SUN, Materials Science and Technology Division, Oak Ridge National Laboratory, YUE WU, ZHIHUA XU, BIN HU, Department of Materials Science and Engineering, University of Tennessee, JIAN-PING WANG, The Center for MINT, and Department of ECE, University of Minnesota, JIAN SHEN, Material Science and Technology Division and Center for Nanophase Materials Science Division, Oak Ridge National Laboratory — The effects of doping magnetic CoFe nanoparticles on electroluminance (EL) efficiency vs. current density, and current density vs. applied voltage for single layer organic light emitting devices (OLEDs) have been investigated. The electron trap densities increased with the increase of CoFe dopants, resulting in a high trap-filled limit (TFL) threshold voltage and significant enhancement EL efficiency (∼27%). The EL efficiencies were further improved (∼5-7%) by applied magnetic field. These improvements could be attributed to the enhancements of the ratios of the formation of excitons, and singlets to triplets, respectively and simultaneously. A maximum 32% enhancement combing the two effects in EL efficiency has been achieved.

[1]This research is sponsored by the LDRD Program of ORNL, managed by UT-Battelle, LLC for the U. S. Department of Energy under Contract No. DE-AC05-00OR22725.

Chengjun Sun
Materials Science and Technology Division, Oak Ridge National Laboratory

Date submitted: 21 Nov 2006 Electronic form version 1.4