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Synthesis and characterization of infrared sensitive rare earth doped optical materials and their applications for bio-imaging

Madhab Pokhrel, Ajithkumar Gangadharan and Dhiraj K. Sardar University of Texas, USA

Trivalent rare earth ions especially erbium (Er3+) and ytterbium (Yb3+) co-doped in various host nanoparticles are known for their extraordinary spectroscopic properties. A thorough optical characterization including the absolute upconversion quantum yield (QY) measurement is of critical importance in evaluating their potential for various photonic applications. In this paper, we will be presenting a measured absolute upconversion QYs for Yb3+ and Er3+ doped in La2O2S under 980 excitation at various power densities. Comparison of absolute QYs for different concentrations of Yb3+ and Er3+ doped in La2O2S will be made for all the upconversion emissions with respect to reported most efficient upconverting phosphor NaYF4 doped with 20% Yb3+ and 2% Er3+. Furthermore, applications of these phosphors in bio-imaging will be explored depending on the measured absolute upconversion quantum yields. In addition, results on *in vitro* imaging using upconverting nanoparticles as a contrast agent will be reported.

Biography

Madhab Pokhrel was born in Nepal. In 2002, he received a M.S. in Physics from Tribhuvan University, Nepal. From 2003 to 2008, he was instructor for physics at St. Xavier's College in Nepal. In fall of 2008, he joined the University of Southern Mississippi and completed his M.S. degree in Applied Physics. He then joined University of Texas at San Antonio for his Ph.D. in Photonics. While pursuing his Ph.D., he has authored or co-authored 12 publications in peer reviewed journals. His future interest is in the area of nanomaterials and understanding their fundamental physical, optical and magnetic properties at nanoscale.

ekf012@my.utsa.edu