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Highly Efficient Near Infrared to Near Infrared Photoluminescence in GdF_3:Nd^{3+} Nanoparticles for Bioimaging[1] MADHAB POKHREL, Univ of Texas, San Antonio, L. CHRIS MIMUN, chris.mimun@gmail.com, AJITHKUMAR GANGADHARAN, BRIAN YUST, ASHISH DHANALE, LIANG TANG, DHIRAJ SARDAR, Univ of Texas, San Antonio, BIOPHOTONICS COLLABORATION — There is an increasing interest in rare earth (RE) doped nanoparticles due to their sharp absorption and photoluminescence (PL) in the near infrared (NIR) spectral region. These NIR based nanoparticles could allow biological imaging at substantial depths with enhanced contrast and high spatial resolution due to the absence of auto fluorescence in biological samples under infrared excitation. In this conference, we present the highly efficient infrared photoluminescence in GdF_3:Nd^{3+} nanoparticles under 800 nm excitation within the hydrodynamic size limitations for bio-applications. The downconversion (Stokes emission) absolute quantum yield (QY) measurements in powder, poly maleic anhydride- alt-1- octadicene (PMAO) coated powder and colloidal solutions have been investigated. QY measurements have revealed that downconversion QY in an average 5 $\pm$ 2 nm sized GdF_3: 1% Nd^{3+} colloidal nanoparticles are 200 times higher than efficient upconversion (UC) particles $NaYF_4$: 20 % Er/ 2% Yb of same size. Furthermore, the utility of these NIR emitting nanoparticles in infrared bioimaging will be demonstrated by confocal imaging and spectroscopic study.

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