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Rare earth doped upconverting particles for different photonic applications[1] MADHAB POKHREL, AJITH KUMAR GANGADHARAN, DHIRAJ KUMAR SARDAR, University of Texas at San Antonio — Trivalent rare earth ions especially erbium (Er^{3+}) and ytterbium (Yb^{3+}) 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 Yb^{3+} and Er^{3+} doped in La_2O_2S under 980 and 1550 nm excitation at various power densities. Comparison of absolute QYs for different concentrations of Yb^{3+} and Er^{3+} doped in La_2O_2S will be made for all the upconversion emissions with respect to reported most efficient upconverting phosphor $NaYF_4$ doped with 20% Yb^{3+} and 2% Er^{3+}. Furthermore, applications of these phosphors in different areas such as bio-imaging, solar cell, security, etc. will be explored depending on the measured absolute upconversion quantum yields. In addition, preliminary results on in vitro imaging using upconverting nanoparticles as a contrast agent will be reported.

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