

Abstract Submitted  
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**Characterization and light emission from Erbium Oxide Nanoparticles** MUHAMMAD MAQBOOL, LYNDIA WILKINSON, Ball State University, IFTIKHAR AHMAD, University of Malakand — The present work reports light emission from Erbium Oxide nanoparticles. The nanoparticles, with 43 nm diameter, were obtained in the form of nanopowder with 99.9% purity. These nanoparticles were characterized for their light emission under a 532 nm Nd:YAG laser excitation. A Photoluminescence (PL) system was used to detect fluorescence emission from the nanoparticles. The PL system consisted of Pixis brand CCD camera with a range of 300 to 2000 nm. The Erbium Oxide nanoparticles were also mixed in distilled water to obtain spectrum. Two emission peaks were observed at 554 nm and 813 nm. The green emission at 554nm was obtained as a result of  ${}^4I_{15/2} \rightarrow {}^4S_{3/2}$  transition, and the near infrared emission from  ${}^4I_{15/2} \rightarrow {}^4I_{13/2}$  transition. The process was also repeated in vacuum and it was found that the green emission enhances tremendously when the nanoparticles are excited in vacuum. This enhanced luminescence from the Erbium Oxide nanoparticles shows their potential importance in the optical devices and Biomedical applications.

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