

Abstract Submitted
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Investigations of Er and Yb Doped Y_2O_3 Nano-powders GAOZAN DING¹, Wheaton College, Norton, MA 02766, MURAT ERDEM, Boston College, Chestnut Hill, MA 02467, XUESHENG CHEN, Wheaton College, Norton, MA 02766, BALDASSARE DI BARTOLO, Boston College, Chestnut Hill, MA 02467, WHEATON LASER MATERIALS RESEARCH TEAM, BOSTON COLLEGE SOLID STATE SPECTROSCOPY TEAM — The purpose of this research is to investigate the Er and Yb doped Y_2O_3 nano-powders, focusing on how the Er and/or Yb concentration affects absorption and infrared to visible upper-conversion luminescence from the materials. Another focus is to study how the infrared excitation power affects red and green upper-conversion luminescence. The absorption spectra are first investigated from 300 nm to 2000 nm for our five samples with various Er and Yb concentrations to determine relevant energy levels and where the strong absorptions are. Their absorption spectra show that all of them have strong absorption around 980 nm. Then the 980nm infrared to the visible upper-conversion luminescence spectra are measured and studied from 400 to 800 nm. All of our samples of different Er and Yb concentrations show strong red and/or green upper-conversion luminescence, the dependence of which on the infrared laser power is examined. Possible upper-conversion mechanisms are proposed from the results of the luminescence's power dependence. Our results show that the Er and Yb co-doped Y_2O_3 nano-powders can be very efficient materials for infrared to visible lighting and other important optical applications. We would like to thank BATi for providing the samples. First author also likes to acknowledge Wheaton's WRP for the support.

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