

Abstract Submitted
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On the pressure dependence of white light emitted by NIR-excited Ytterbium(III) -doped Yttrium Silicate nanopowders¹ HATUN CINKAYA, Boston Coll, GONUL ERYUREK, Istanbul Technical University, CONOR KELLY, Boston Coll, GOKHAN BILIR, Istanbul Technical University, MURAT ERDEM, Marmara University, JOHN COLLINS, Wheaton College, BALDASSARE DI BARTOLO, Boston Coll — The production of white light by exciting nanopowders doped with rare earth ions with several infrared laser radiation has attracted the attention of researchers. In the present study, we have directed our attention to yttrium silicate nanopowders doped with 5% per mole ytterbium (III) illuminated by the output of a diode laser LDI-820 (975 nm). The particle size was found as ~ 70 nm from Scherrer equation. In particular, we have investigated the effect of pressure on the emission from the nanopowders and we have found a considerable difference while varying this physical parameter. At high pressure, the output from the nanopowder is represented by groups of sharp lines due to ytterbium cooperative emission and unwanted erbium impurities. As the pressure decreases to 0.01 mbar, the spectrum changes to a wide band resembling the white light spectra.

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