

**Preparation of Ce: YAG nanophosphor by laser sintering**

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**Abstract:** The electric energy consumed for illumination being more than 20 % of the total energy produced world-wide, has resulted in an intense research activity to develop more and more energy efficient light sources for illumination applications. Development of white LED recently has been a huge success in this field as its theoretical energy efficiency could be > 95 %. Ce: YAG being the workhorse of white LED industry its manufacturing techniques are continuously improved to produce better and better material at lower and lower cost. One such step in this direction is laser sintering which inherently produces purer material at lower cost. In the present study a CW CO<sub>2</sub> laser radiation was used to sinter Ce: YAG precursor prepared by sol-gel technique. Crystalline phase could be realized when irradiated by unfocused 80W CW CO<sub>2</sub> laser radiation for about two hours compared to 8-12 hours needed for sintering by conventional furnaces. The nanophosphor thus prepared was characterized by XRD, photoluminescence and thermo-luminescence techniques. The average size of the crystallites calculated from XRD pattern was about 28 nm. The nanophosphor showed characteristic Ce<sup>3+</sup> emission around 530nm when excited by 350 and 465nm radiation; excitation by 465 nm is interesting for white light emitting diode application. Also, the phosphor showed almost linear increase in the observed intensity of thermal luminescence up to 2500 mGy radiation dose