

08,09

## NaSrBO<sub>3</sub>:Ce,Yb Phosphor for NIR Emission around 1 μm

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Received: December 25, 2020

Revised: December 25, 2020

Accepted: January 1, 2021

Synthesis and characterization of NaSrBO<sub>3</sub>:Ce,Yb phosphor is described. NaSrBO<sub>3</sub>:Ce phosphor exhibited characteristic Ce<sup>3+</sup> emission around 414 nm. Co-doping with Yb<sup>3+</sup> resulted in near-infrared (NIR) emission around 981 nm. This is attributed to phonon-assisted cooperative energy transfer from Ce<sup>3+</sup> to two Yb<sup>3+</sup> ions. Ce<sup>3+</sup> → Yb<sup>3+</sup> energy transfer is proved using a variety of measurements such as dependence of photoluminescence intensity of visible and NIR emissions on Yb<sup>3+</sup> concentration, excitation spectrum for Yb<sup>3+</sup>, accelerated decay of Ce<sup>3+</sup> emission after Yb<sup>3+</sup> codoping, etc. Using lifetime measurements, the efficiency of Ce<sup>3+</sup> → Yb<sup>3+</sup> energy transfer is estimated to be 48.65%.

**Keywords:** near-infrared, photoluminescence, Ce<sup>3+</sup> → Yb<sup>3+</sup> energy transfer, borate.