

# Up-conversion luminescence in phosphors based on a Holmium co-doped solid solution based on Yb doped BiVO<sub>4</sub>

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Ho<sup>3+</sup>–Yb<sup>3+</sup> co-doped BiVO<sub>4</sub> phosphors were prepared through the solid-state reaction method (Ho<sup>3+</sup> varied 0.1 to 5% and Yb<sup>3+</sup> fixed at 2%) and were characterized by X-ray diffraction, where was confirmed the insertion of Ho<sup>3+</sup> and Yb<sup>3+</sup> ions into the BVO lattice formation of secondary phases. The microstructures of the samples were analyzed via FE-scanning electron microscopy, with no significant structural changes observed in the structure of BiVO<sub>4</sub>.

Even under low power, co-doped samples exhibit green (550 nm) and red (660 nm) emissions under 980 nm excitation, with red being the most intense emission. Phosphors presented CIE color coordinates located in the orange region, where the displacement observed after 1 mol% of Ho<sup>3+</sup> could be explained by the greater decrease in the intensity of red [1-3]. Ho<sup>3+</sup>–Yb<sup>3+</sup> co-doped BiVO<sub>4</sub> system could be an interesting candidate for optical applications using infrared as the excitation source.

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