

# SYNTHESIS AND LUMINESCENCE IN Nd<sup>3+</sup> DOPED CaYAl<sub>3</sub>O<sub>7</sub>

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CaYAl<sub>3</sub>O<sub>7</sub>:Nd<sup>3+</sup> (CYA:Nd<sup>3+</sup>) powder samples doped with different concentration of Nd<sup>3+</sup> ions were prepared using high-temperature solid state method. X-ray diffraction analysis including Rietveld method was used to study the structure of the obtained material. Absorption and luminescence spectroscopy measurements were performed in the temperature range from 10K to 300 K.

The X-ray diffraction analysis indicated that pure CYA powder corresponds to tetragonal CaYAl<sub>3</sub>O<sub>7</sub> with melilite-type structure. In the selected CaYAl<sub>3</sub>O<sub>7</sub> powder sample doped with 3 at.% of Nd<sup>3+</sup> ions, the analysis indicated the dominant presence (about 97 wt.%) of a tetragonal CaYAl<sub>3</sub>O<sub>7</sub> phase.

Excitation in the UV range resulted in the visible and near-infrared emission of Nd<sup>3+</sup> which showed a strong dependence on temperature and activator concentration. Based on the experimental data, various energy transfer processes were identified, and optimal amount of neodymium was determined.

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