

Temperature dependence of Ce-emission kinetics in YAG:Ce optical ceramic.

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Streszczenie

We have measured the scintillation decay kinetics of the Ce-emission from a YAG:Ce optical ceramic material over a temperature range between 110 and 450 K. Above room temperature the decay can be well described by the sum of two exponential terms, but below room temperature a third term is needed. This new component has a characteristic time shorter than the radiative lifetime of the Ce ion, varying from 33 ns at 110 K to 18 ns at 300 K. The presence of the short component can be explained in terms of the distortion of the YAG host band structure and the introduction of surface-boundary states into the otherwise forbidden energy region, which drains the emitting 5d levels of Ce ions located in the vicinity of the grain-boundaries.

Słowa kluczowe

YAG:Ce, Scintillator, Transparent ceramic, Recombination and trapping, Grain boundaries

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