On site-selective optically and thermally induced processes in Lu_2O_3:Tb,Ta storage phosphors.

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Streszczenie

Photo- thermo- and optically stimulated luminescence properties of Lu_2O_3:Tb,Ta ceramics sintered at 1700°C in air were investigated. Low temperature (10K) excitation and emission spectra using synchrotron excitation in the range of 150–330nm are also discussed. The effect of the dopant contents on the various luminescence effects and processes was tackled. The ceramics showed intense thermoluminescence (TL) and the glow curve consisted of two main peaks around 170 and 250°C upon 5°C/s heating rate. The shape of the glow curve and TL intensity depended strongly on the dopant concentrations. Above 0.1% of their contents the TL quickly lessened to disappear around 1%. This was in contrary to photoluminescence which hardly showed any quenching up to the concentration of 1%. In addition to the regular first order TL kinetics some contribution from tunneling and semi-localized transitions was proved.

Słowa kluczowe

storage phosphor, carriers trapping, optical bleaching, luminescence

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