SrS:Ce and $LuPO_4$:Eu sintered ceramics : old phosphors with new functionalities.

Autorzy

Eugeniusz Zych

Dagmara Kulesza

Justyna Zeler

Joanna Cybińska

Karolina Fiączyk

Aneta Wiatrowska

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Streszczenie

Properties of SrS:Ce and $LuPO_4$:Eu sintered ceramics are reported for the first time. Both materials were sintered at various temperatures up to 1700°C. SrS:Ce sintered ceramics were found to form a new luminescent center(s) giving emission with maximum around 620 nm or 700 nm for 0.05% Ce and 5% Ce, respectively. This red-infrared band was continuously more potent with increasing sintering temperature and also for higher Ce concentrations both in photo- and radioluminescence. The new luminescent feature was shown to be formed by Ce^{3+} ions with strongly perturbed symmetry compared to the octahedral one offered by the SrS host. After irradiation with X-rays $LuPO_4$:Eu sintered ceramics produced a long lasting afterglow luminescence which was connected with thermoluminescence around 200°C. The shape of the glow curve bands change with Eu concentration. For Eu content of 0.1% the TL band was quite symmetrical. For 5% of Eu the TL glow band appeared more structured and the 200°C peak was associated with intense components around 150°C and 330°C. The former contributed into more potent afterglow at room temperature. Sintering of SrS:Ce and $LuPO_4$:Eu induced new luminescent characteristics of both compositions endowing them with new, potentially usable functionalities.

Słowa kluczowe

energy storage, luminescence, sintering, thermoluminescence

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