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Scintillation characteristics of liquid phase epitaxy grown GAGG:Ce single crystalline films

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The Gd3(Al,Ga)5O12:Ce single crystalline films were grown by liquid phase epitaxy (LPE) technique from BaO-B2O3-BaF2 flux. The scintillation characteristics were investigated and compared to the bulk Czochralski-grown single crystal of similar composition. The light yield (LY) and energy resolution were measured using an R6231 photomultiplier under excitation with α - rays. At 5.155 MeV - rays, the LY value of 5980 photons/MeV obtained for the LPE sample is lower than that of 7050 photons/MeV for the bulk sample whereas an energy resolution of the LPE sample is better (6.0 % vs. 7.5 %). The LY dependence on integration time measurements show a lower contribution of slow components in the scintillation pulse of LPE sample with respect to bulk sample. The ratio of LY value under excitation with - and - rays (/ ratio) is also determined.

Keywords: Energy resolution, Gd3(Al,Ga)5O12:Ce, Light yield, Liquid phase epitaxy, Scintillation

Has accepted

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