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Investigation of Luminescent Properties of LSO:Ce, LYSO:Ce and GSO:Ce Crystal Scintillators under Low Energy Gamma Ray Excitation Used in Nuclear Imaging

LSO:Ce, LYSO:Ce and GSO:Ce single crystal scintillator light emission characteristics were studied in low γ -ray energy range (Tc-99m source) used in nuclear medical imaging. The absolute luminescence efficiency and the optical emission spectrum of the three scintillators was measured, under γ -ray excitation using an integration sphere coupled to a photomultiplier and a spectrometer respectively. Spectral compatibility of all scintillators to optical sensors was also estimated. The absolute efficiency of all crystals was found adequately high. Their emission spectrum was found compatible (70% - 95%) to most currently employed optical photon detectors.

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