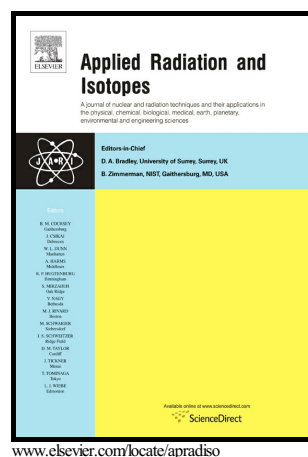


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Synthesis of β -Ca₂P₂O₇:Tb³⁺ to gamma radiation detection by thermoluminescence

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Abstract

In this work, luminescent emissions of beta-calcium pyrophosphate doped with terbium ions (β -Ca₂P₂O₇:Tb³⁺) were studied. The Ca₂P₂O₇:Tb³⁺ powders were prepared by precipitation and annealed at 900 °C for 2 hrs was applied on the powders to observe the beta phase. Radioluminescence measurements showed emission bands related with ⁵D₃ (⁵D₄)→⁷F_J transitions of Tb³⁺ ions. Three overlapped peaks at 126, 165 and 220 °C were observed in thermoluminescence response. A linear TL dose-response in the range of 0.2 Gy to 10 Gy and an acceptable TL reproducibility were showed by the β -Ca₂P₂O₇:Tb³⁺ samples exposed to ⁶⁰Co gamma radiation. The TL glow curves were analyzed by Initial

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