of pellets were studied by TL under the effect of different doses of γ-irradiation. The phosphor exhibited a TL emission curve with four TL peaks centered at 100, 182, 250 and 290 °C, with a light emission band centered at 385 nm. The TL dose-dependent γ-radiation dose response of the TL peak at 182 °C was linear in the low-dose region, from the order of mGy to 50 Gy. In addition, the phosphor exhibits lower fading and good reproducibility.

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Title of the abstract: TL and OSL characterization of CaSO4:Tb, CaSO4:Mn AND CaSO4:Mn,Tb phosphors

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Abstract: The objective of this work was to investigate the luminescence properties of CaSO4:Tb, CaSO4:Mn e CaSO4:Mn,Tb synthesized by slow evaporation route. The crystalline structure, morphology, thermal and optical properties of the phosphors were characterized by X-ray diffraction analysis (XRD), Scanning electron microscopy (SEM), thermogravimetric analysis (TGA) and radioluminescence (RL). Moreover, using thermoluminescence (TL) and optically stimulated luminescence (OSL) techniques, the dosimetric properties of the phosphors were comprehensively investigated, such as emission spectra, glow curve reproducibility, dose-response linearity, fading of the luminescent signal, OSL decay curves, correlation between TL and OSL emissions and minimum detectable dose (MDD). For dosimetric analyses the samples were irradiated with doses of between 169 mGy and 10 Gy. TL emission spectra confirmed the presence of Tb3+ and Mn2+ ions in crystalline matrices. The samples showed a typical exponential OSL decay curve with the predominance of a fast decay component, indicating that the traps have a high photoionization cross-section for blue LEDs, and a MDD on the order of mGy. The luminescent signals showed to be linear and reproducible in the studied dose range. The trapping centers located between 0.63 eV and 1.07 eV were revealed. The high TL sensitivity of phosphors was proven when comparing with commercially available dosimeters. It was also observed that co-doping with Mn and Tb contributed to a reduction in fading compared to CaSO4:Mn and CaSO4:Tb.

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Title of the abstract: Alanine dosimetry for auditing and preclinical research in FLASH proton beams: Beam-quality correction factors outside the plateau region based on graphite calorimetry

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