

Finnish Spectrolite as High-Dose Gamma Detector
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A stone called Spectrolite, from the group of Silicates (tectosilicates), natural from Finland, and acquired at an open market, was studied in this work. The purpose was to test it in gamma radiation beams to verify its performance as a high-dose detector. From this natural stone, pellets were manufactured, and the material response was verified using two luminescent techniques: thermoluminescence (TL) and optically stimulated luminescence (OSL). Initially, the samples were irradiated at the Radiation Technology Center, at IPEN, using a Gamma-Cell 220 System and a Panoramic source (^{60}Co). The TL and OSL responses of the samples were obtained using a TL/OSL Risø System, model TL/OSL-DA-200. The following characterization tests were undertaken: TL glow curves, OSL signal decay curves, TL and OSL dose-response curves, and the reproducibility of response. This material was also tested in alpha and beta radiation beams, in order to observe its response behavior. Besides these tests, the detectors were also submitted to two another experiments: exposure to ultraviolet (UV) light without a previous gamma irradiation, and to the UV light following a gamma irradiation. This objective was to analyze the performance of this material when exposed to UV light and to observe the possibility of its application using the photo-transferred TL (PTTL) and photo-transferred OSL (PTOSL).

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