

## **Study of the luminescent behavior of Spectrolite+Teflon pellets in $^{90}\text{Sr}+^{90}\text{Y}$ beams**

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Natural materials, as for example Quartz, Spodumene, Rhodonite and Diopside, have been tested in ionizing radiation beams by different research groups in several countries. The Spectrolite, from Finland, was already studied in relation to its thermoluminescence (TL) and optically stimulated luminescence (OSL) responses at IPEN, in high-dose gamma radiation fields. The results on the dosimetric characteristics indicated their good application as gamma radiation detectors.

In the present work, the luminescent behavior of Spectrolite+Teflon samples was studied in beta radiation beams of a  $^{90}\text{Sr}+^{90}\text{Y}$  source. The response of these samples was investigated using the luminescent phenomena of TL and OSL. The pellets were exposed to the  $^{90}\text{Sr}+^{90}\text{Y}$  source of the TL/OSL Risø System, model TL/OSL-DA-20. This same TL/OSL system was used to evaluate the TL and OSL responses of the samples.

Initially, the powdered Spectrolite material was analysed in relation to its crystalline structure (X-ray diffraction (XRD)), morphology (scanning electronic microscopy (SEM)) and chemical composition (energy-dispersive X-ray spectroscopy (EDX)). Afterwards, the following dosimetric parameters were obtained: TL glow curve, OSL signal decay, reproducibility of TL/OSL responses, dose-response curves, lower detection limits and fading of the TL/OSL signals.

The objective of this study was to verify the possibility of the application of Spectrolite+Teflon pellets as efficient radiation detectors for beta dosimetry, in a dose interval of 100 mGy to 1 kGy; all the results obtained revealed their good performance.