

# Preliminary studies of Optically Stimulated Luminescence of rose quartz

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Radiation detectors are mainly used for the detection of doses absorbed, in industrial applications, in the environment or in humans. This work aims to study the luminescent properties of rose quartz (SiO<sub>2</sub>). The samples will be evaluated using the optically stimulated luminescence (OSL) technique. OSL is the luminescence emitted from the recombination of charges optically released from specific traps inside of a material previously irradiated with ionizing radiation [1]. For this research, samples of rose quartz are being used and analyzed by X-ray diffraction (XRD), which presented a single crystalline phase, and X-ray Fluorescence (XRF), which presented impurities. The OSL measurements were carried out using a Risø OSL reader (model DA-20) and was stimulated using blue light emitting diodes (470 nm, FWHM = 20 nm) delivering 80 mW/cm<sup>2</sup> at the sample position in CW mode. The characteristics studied were dose-response (0.02 up to 1 Gy), reproducibility, repeatability and fading. The parameters of the OSL curves were analyzed by the OriginLab software and by the R language with the RStudio software. The results obtained until now demonstrate that rose quartz is sensitive in a large range of doses, presenting an OSL signal that varies linearly with the dose, with a correlation coefficient between the area of the OSL curves and the dose of  $R^2 = 0,99$ . The OSL response of the material will be better evaluated by reproducibility and repeatability analyses. Fading measurements will also be carried out in order to produce a radiation detector that meets the necessary requirements for dosimetry.

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## References:

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