

of 252°C for TLD-100, 312°C for TLD-200, 398°C for TLD-400 e 226°C for TLD-900. The second step was to analyze the TL response after irradiation and a thermal treatment post-irradiation (TTPI) of 280°C/15 min for TLD-100 e TLD-900, 300°C/15 min for TLD-200 and 400°C/15 min for TLD-400; the highest TL emission occurred at 362°C (TLD-100), 139°C (TLD-200), 398°C (TLD-400) and 397°C (TLD-900). The third step was the verification of the PTTL signal, obtained after irradiation, TTPI and illumination (with UV leds) of the materials at the conditions of 265 nm/5 min for TLD-100 and 365 nm/5 min for TLD-200, TLD-400 e TLD-900. For TLD-100, a PTTL signal was verified, because two new peaks emerged at 133°C and 261°C; for TLD-200 and TLD-400 no PTTL signal was observed; for TLD-900 it was possible to obtain a PTTL response once a peak appeared at 197°C, which did not exist after irradiation and TTPI (second step). In order to continue studying the PTTL signal, this response was verified varying the illumination time for the four materials between 2.5 min and 25 min. The PTTL response maximum was observed for 15 min illumination for all the materials. The PTTL was also studied in function of the wavelength for 265 nm, 310 nm, 365 nm, 400 nm e 420 nm; the results showed that the most intense signal occurred at 265 nm for TLD-100, -400 and -900, and 365 nm for TLD-200.

ID_219

Title of the abstract: Characteristics of ZnO film for real-time X-ray radiation dosimetry

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Abstract: Radiation dosimetry refers to the study of detection and measurement of ionizing radiation dose. In active radiation dosimetry one uses a material and electronic circuitry to measure ionizing radiation dose in real-time. Here we report X-ray radiation sensing characteristics of ZnO films of different thicknesses and explore its potential for measurement of X-ray radiation dose at real-time. The films are coated on glass substrates using a sol-gel spin coating technique. Measurements of current-voltage (I-V) characteristics reveal that the resistivity of the device under X-ray radiation decreases ~10 times than the corresponding value under dark condition. The signal-to-noise ratio of the device is found to vary with the bias voltage as well as thickness of the ZnO layer. The dose rate response of the device is studied by increasing the dose rate of the X-ray source from 0.015 to 0.293 Gy/s at a constant bias voltage. The device shows a sublinear response within the given dose rates. The device is also tested to be visible blind between 370 and 700 nm and the response time is found to be less than 1 s. All these features encourage potential application of ZnO film for active radiation dosimetry.

ID_221

Title of the abstract: Computational and experimental analyses on the origin of TL and OSL signals in undoped and doped compounds

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Abstract: The main objective of this work is to present the current knowledge concerning the origin of the luminescent signal generated through Thermoluminescence (TL) and Optically Stimulated Luminescence (OSL) techniques in well-known compounds. The discussion about this mechanism involves experimental

analysis, atomistic simulation, and literature review. Materials such as undoped or doped magnesium tetraborate (MgB_4O_7) were examined as examples. The atomistic simulation was carried out using GULP, a well-established tool that enables, among others, the analysis of energy formation of various point defects. The experimental measurements were conducted using the Riso reader on materials that were produced and characterized. Combining different methodologies, it became feasible to ascertain the most likely point defects in each studied compound. The outcomes obtained from the study of undoped MgB_4O_7 enabled the identification of the likely defects responsible for the emitted signal in this material. We also developed a proposal to explain the formation of the MgO anti-Schottky defect, which presented the lowest energy solution (eV/defect) among the analysed defects. In the case of Li-doped MgB_4O_7 , a hypothesis was postulated to elucidate the suppression in the signal caused by the presence of lithium. Furthermore, computational analysis was conducted on Ce-doped and Ce-doped/Li-codoped MgB_4O_7 , which has garnered significant attention due to its potential applications as TLD and, more notably, OSLD. In this instance, experimental analysis and literature review revealed compelling evidence of a complicated correlation between the dopant concentrations and the resulting signals, which require further investigation in future studies. This type of information is highly significant in the present era when better comprehension of the origin of the signal could lead to an enhanced capability to design new dosimeters and gain deeper insights into the behavior of currently used materials.

ID_222

Title of the abstract: Study of the TL dosimetric properties of lithium silicate phosphor for gamma dosimetry

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Abstract: Radiation quantification or dosimetry can be performed in several ways, generally based on the physical effects caused by radiation on a given material. One way of detecting radiation is by using thermoluminescent materials. These materials are capable of emitting light when heated provided they are previously exposed to ionizing radiation.

Silicates are an attractive class of materials among inorganic phosphors, due to a wide range of applications and certain properties, such as chemical stability, transparency to visible light, physicochemical stability at high temperatures, among others. A very important characteristic of silicates is the sensitivity to ionizing radiation for a certain energy range.

Silicates with a cation in their crystal structure, such as pure and doped lithium silicate synthesized by different methods, exhibit certain properties like luminescence in the visible region, physicochemical stability at high temperatures and radiation stability.

In the present work, we have synthesized lithium silicate (LSO) by solid-state reaction sintering method and studied the dosimetric properties in terms of its thermoluminescence (TL) response such as: linear response to γ -exposure, fading behavior, sensitivity to γ -exposure, minimum detection dose, repeatability, and its TL emission characteristics. The structure of the synthesized material was determined by X-ray diffraction (XRD) method and Rietveld refinement method. The dosimetric properties of LSO in the form