radionuclides neutron sources at different incidence angles. The largest overestimation ratio (29.7) was obtained for mixed energy fields (Bare Cf-252 source at 0° and additional thermal field). Since the reference irradiations were carried out, in accredited laboratories (PTB, IRSN), the results at reference doses are used for the calculation of field-specific corrective factors at different workplaces. In this work, an experimental and theoretical characterization of neutron exposure at the NUR research reactor and at the Secondary Standard Dosimetry Laboratory (SSDL) where the neutron irradiator OB26 based on Am-Be source is located are presented and their field-specific corrective factors are calculated. Finally, the impact of the use of the ICRU report 95 is also evaluated and discussed.

ID_257

Title of the abstract: Correlation analysis of the natural radionuclides in soil and radon exhalation rate in Tamanghasset district, Algeria

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Abstract: Soil is the top surface of the earth's crust; it contains radionuclides headed by the radioactive decay series 238U, 232Th which contribute with 40K of about 30% to 60% of the internal radiation dose. Radon (222Rn), is a naturally occurring radioactive isotope of 238U series, is one of the significant sources of natural radiation. The radon decay products which are attached in aerosol cause greater biological effect through inhalation and can lead to lung cancer on prolonged exposure. The most dominant source of indoor radon is the underlying soil, so the enhanced levels of radon are usually expected in mountain regions and geology units with high radium and uranium content in surface soils. Therefore, a correlative analysis between radon exhalation rate and soil characteristics has been made in order to estimate the geogenic radon potential of Tamanghasset areas, situated in the central Hoggar volcanism (from Eocene to Quaternary in age) in the south of Algeria.

The radon surface exhalation rates varies from 0.3 to 96.6 $mBq.m^{-2}.s^{-1}$ while concentrations of 238U, 232Th and 40K varies from 10.7±6.1 to 276.8±16.7, from 31.0±3.1 to 265.8±18.1 and from 241.8 ± 24.7 to 1879.2 ± 79.8 Bq.kg-1 respectively. A positive correlation coefficient has been observed between uranium concentration and radon exhalation rate of soil (R^2= 0.43).

ID_259

Title of the abstract: Verification of the PTOSL signal from radiation detectors using a 60Co beam and UV light from LEDs

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Abstract: Radiation processing techniques induce physical, chemical and biological changes in the structures of materials, instruments and food to reach a certain desired benefit. For this reason, the systematic and periodic radiation dosimetry is so essential to determine the absorbed dose of radiation sources. If the absorbed dose applied to the materials does not correspond to the desired one, the effects in their structures can be adverse. Solid state dosimeters are radiation detectors that are already well established in routine procedures and described in the literature for gamma radiation dosimetry, such as 60Co, with beams employed em radiation processing. This work aims to study the response of commercial dosimeters based in their luminescence phenomenon using the optically stimulated luminescence (OSL) technique. Then, it seeks to verify the phototransfer effect presented by the dosimeters employing the phototransferred OSL technique (PTOSL), for further analysis of the possibility of applying these materials and these techniques for 60Co beam dosimetry. In this work, the OSL/PTOSL responses of LiF:Mg,Ti (TLD-100), CaF2:Dy (TLD-200), CaF2:Mn (TLD-400) and CaSO4:Dy (TLD-900) commercial dosimeters were studied in three steps: 1) OSL after irradiation; 2) OSL after irradiation + thermal treatment post-irradiation (TTPI); 3) PTOSL after irradiation + TTPI + illumination with UV of light-emitting diodes (LEDs). The irradiations were carried out with a 60Co beam from a Gamma-Cell system (383.65 Gy/h - October/2022). All the measurements were taken using the Risø reader system, model TL/OSL-DA-20, and with an illumination time of 100 s. The first phase was to irradiate the dosimeters with the following absorbed doses: 0.7 Gy (TLD-100 and -900), 20 Gy (TLD-200) and 50 Gy (TLD-900), and to measure the OSL signal. The values of the initial decay of the OSL curves were about 3x103 counts (TLD-100), 1x103 counts (TLD-200), 5.4x103 counts (TLD-400) and 9.5.102 counts (TLD-900). For the second phase, the pellets were initially irradiated with the same doses previously given and submitted to the TTPI of 280°C/15 min (TLD-100 e -900), 250°C/15 min (TLD-200) e 350°C/15 min (TLD-400); the first point of the OSL signal was observed at about 400 counts (TLD-100), 460 counts (TLD-200), 530 counts (TLD-400) and 660 counts (TLD-900). In the third phase, the dosimeters were irradiated, treated with TTPI and illuminated with UV of 265 nm/10 min (TLD-100) and 365 nm/10 min (TLD-200, -400 and -900). Comparing these last results with those from the second step, it was possible to observe PTOSL for TLD-100 and -900, because an increase in the signal intensity was observed for both materials. For TLD-200 and -400, the signals were similar for the second and third steps, but more studies are necessary for a final conclusion.

ID_261

Title of the abstract: The evolution of radon concentration measurement methods using SSNTD – UKHSA perspective

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Abstract: Solid state nuclear track detectors (SSNTD), particularly those using poly-allyl diglycol carbonate polymer, have a long history of application in measurements of ionising radiation. SSNTD works on a principle of alpha or neutron particles creating microscopic defects in the detection material that can be revealed by etching treatment with chemicals or alternatively electrochemically. The number of tracks and/or area covered by tracks can be directly related to the total radiation exposure that the detector has received. The most common analytical method to count tracks is based on an optical image capture followed by an analytical track discrimination aided by PC software.

More than 40 years ago, the United Kingdom Health Security Agency (UKHSA), and its predecessor organisations, established a radon measurement laboratory to deliver radon measurement services for homes and workplaces in the UK. The main purpose for the creation of the service was to identify premises where remedial action is needed, as radon (Rn-222) is the largest source of natural radiation exposure for most of the population and a proven lung carcinogen.

Since the start of the radon measurement service, over 500,000 SSNTD detectors have been analysed in the laboratory. The very first method used was manual track counting using an optical microscope.