transduction is described here using Americium-241 and Beryllium as an example. The conceptual example is supported with particle transport simulations in a simple geometry.

Experimental Radon Exhalation Measurements: Comparison of different techniques.

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Radon is a radioactive gas produced by the radioactive disintegration of radium and uranium. Its presence in soils and construction materials, in conjunction with the incredibly concern which exists regarding pollution and safety of the population in present time, makes it necessary to investigate the methodologies to measure radon exhalation. Moreover, according to the Directive 2013/59 / EURATOM which should be incorporated into Spanish law in 2018, this kind of measures will increase in the next future.
To measure radon exhalation rate, four specific methods have been selected among all the different existing technologies: soil gas probe connected to a continuous radon detector, surface emission chamber connected to the radon detection monitor, chamber H connected to an electret and active charcoal canister measured with a sodium iodide scintillation detector.
Radon exhalation field measurements have been performed at a location where the exhalation values of radon are in the range of 850 to 27.000 Bq/m3. This work shows the results of measurements carried out with these different technologies and its comparison. The study of radon exhalation techniques is an important work to comply with the next future legislative requirements in terms of radon exhalation.

60Co irradiation effects in Gd2O3 and Er2O3 nanoparticles

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Enhanced radiosensitization in tissues using high-Z materials has been observed since 80’s, and the application of nanoparticles (NPs) for this purpose has been widely

studied in the past years. NPs use in radiotherapy procedures implies to submit them to high dose radiation beams which might cause damage to these particles resulting in the release of toxic material to the biological environment. In order to verify radiation effect in Gd2O3 and Er2O3 NPs doses from 3 Gy to 20 Gy produced by a 60Co source were tested. The study with X-ray diffraction (XRD) showed, for Gd2O3-NP samples, a change in peaks positions featuring a decrease in the lattice parameter as function of dose increase up to 5 Gy. From this point lattice parameter presented no significant change. For Er2O3-NP the lattice parameters do not present a behavior in function of dose. A peak change can be noticed for samples irradiated with 5 Gy and 20 Gy, and samples irradiated with 3 Gy, 7 Gy and no irradiated presented no significant peak displacement. Perturbed angular correlation (PAC) gamma-gamma spectroscopy was performed using 111In(111Cd) as probe nuclei. Despite non-symmetric site C parameters presented no substantial change results showed a slight variation of eta parameter for the symmetric site D for both samples, which may indicate a distortion at that site caused by the radiation. This study showed that radiation doses used in radiotherapy procedures may cause damage to nanoparticles structures. However, this damage is not great enough to break the nanoparticle and liberate toxic Gd3+ or Er3+ into patient organism.

Poster Session I, St. Gallen Room, 15:40-17:30

Estimation of the Radiation induced cataract and cancer effects in CT brain Procedures

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