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Dosimetric Characterization of the ISOGAMMA LLoCo Irradiator.

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All irradiation facilities must, before being put into operation, perform dosimetric characterization of the radiation field. This data obtained from the commissioning dosimetry is used to determine the irradiation times necessary so that irradiated products receive the required absorbed dose value, and establishes the facilities operational parameters, such as dose uniformity ratio, and maximum and minimum dose positions.

The ISOGAMMA LLoCo radiation facility at CEADEN had no such procedure carried out during commissioning by the manufacturer. Thus, it was necessary to perform dosimetric trials to characterize the dose distribution in the irradiation chamber of the facility, to contribute to the correct operation of the facility, and ensure the quality of future radiation process.

The experimental measurement points were selected taking into account the geometry of the irradiation chamber and dosimeters were distributed in the areas where the maximum and minimum dose values were expected. Initially, the Fricke dosimetric system was used to determine dosimetric characterization, and considering the cylindrical geometry of the irradiation chamber and its dimensions, the chamber was divided into three study zones. The dosimeters were measured by using the spectrophotometric method. Later, the alanine-ESR dosimetric system was employed to determine the dose distribution and the chamber was divided into six study levels, and alanine dosimeters were measured by using the electron spin resonance (ESR) technique with MiniScope 400 equipment.

In this experimental work, the dosimetric characterization of the ISOGAMMA LLoCo radiation facility was measured with two different dosimetric systems. The measured dose distribution has a similar profile for both dosimetric systems and the highest dose values are observed in the central part of the radiation chamber and the lower dose values in the upper and bottom parts.

Country/Organization invited to participate

Cuba

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