

ON LINE HIGH DOSE STATIC POSITION MONITORING BY IONIZATION CHAMBER DETECTOR FOR INDUSTRIAL GAMMA IRRADIATORS

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The processing in an industrial gamma irradiator is usually carried out in dynamic form, where the products pass around a gamma source. However, in some situations, mainly for research purposes or for validation of customer process following the ISO 11137 requirements, the irradiation of small samples in a static position with more accurate doses is required. Nowadays, the samples are put inside the irradiation room at a fixed distance from the source and the dose is usually determined using dosimeters, so the dose is only known after the irradiation. In spite of this, as the dynamic irradiation is not interrupted, containers with different kinds of the products and different densities cross between the samples in the static irradiation position and the radioactive source, so there is a dose rate variation in that position. A cylindrical ionization chamber of 1 cm³ was developed to measure high doses on line during the sample irradiation in a static position, in a ⁶⁰Co industrial plant. The developed ionization chamber showed suitable to be used as a dosimeter on line. A good linearity of the detector was found between the dose and the accumulated charge independently of the different dose rates caused by absorbing materials.