

Thermal Analysis of a Graphite Calorimeter for the Measurement of Absorbed Dose for Therapeutic X-Ray Beam

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Abstract : Heat transfer in a graphite calorimeter is analyzed by using the finite elements method. The calorimeter is modeled in 3D geometry. Quasi-adiabatic mode operation is realized in the simulation and the temperature rise by different sources of the ionizing radiation and electric heaters is compared, directly. The temperature distribution caused by the electric power was much different from that by the ionizing radiation because of its point-like localized heating. However, the temperature rise which was finally read by sensing thermistors agreed well to each other within 0.02 %.

Keywords : graphite calorimeter, finite element analysis, heat transfer, quasi-adiabatic mode

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