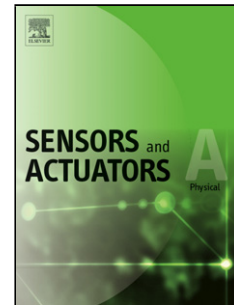


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Characterization of fiber radiation dosimeters with different embedded scintillator materials for radiotherapy applications

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Highlights:

1. An embedded structure X-Ray optical fiber dosimeter is presented to monitor real time absorbed dose *in-vivo*.
2. We identified five kinds of scintillator materials to select the optimum one for the dosimeter.
3. Every scintillator material has their own emission spectra and characteristics when exposed to X-Rays.
4. Gd₂O₂S:Tb is the optimum choice of material for the X-ray optical fiber dosimeter.

Abstract: *In-vivo* real-time dose rate measurement has attracted much attention in the tumor-treatment field because of the demand for precise delivery of radiotherapy. An optical fiber based dosimeter is presented, which is fabricated by embedding scintillator materials inside the fiber core. Five micron-scale powder based scintillator materials have been identified and their characteristics are compared in this investigation. The dosimeters have been fabricated separately but with exactly the same production process. Their emission spectra have been measured.

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