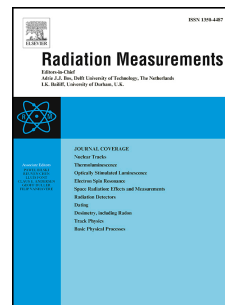


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Investigation of a novel chemically cross-linked fricke-Methylthymol blue-synthetic polymer gel dosimeter with glutaraldehyde cross-linker

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Abstract

A novel radiosensitive composition of radiochromic gel dosimeter based on Fricke polyvinyl alcohol (PVA), Methylthymol blue dye (MTB), and chemical cross-linking agent glutaraldehyde (GTA) is presented and studied. Due to the MTB-PVA-GTA dosimeter having a transparent solid cross-linked formulation, this new composition can be used with 2D and 3D optical detection instruments. It can be scanned at higher wavelengths compared to conventional Xylenol orange (XO) containing gel (620-625 nm vs. 585-587 nm). The transparent chemically cross-linked dosimeter was evaluated using optical detection methods; spectrophotometry and 2D optical imaging system of charge-coupled-device (CCD) camera with a uniform red light-emitting-diode (LED) array source. Additionally, the dosimeter showed a promising high

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