

عنوان مقاله:

Dosimetry study of ionizing radiation by various DVD layers using atomic force and optical microscope

محل انتشار:

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خلاصه مقاله:

Introduction: So far, solid state nuclear track detectors like CR-39 has been used for neutron dosimeter and ionizing radiation in the nuclear industry, Space Sciences, Medicine and Accelerators by calculating track specifications and LET. In this study, was tried to introduce a suitable material instead of CR-39 for dosimeter studies. Research method: The DVD is composed of different layers, and the various layers of the DVD are separated by heat, divided to 1cm 2 pieces and is cleaned and after provide the conditions, various layers of the DVD were put under the alpha radiation due of ^{241}Am for 20 minutes. Then the detectors were etched for 10 minute intervals using 6N Sodium Hydroxide at 70°C . Tracks created in different layers of the DVD are also viewed by atomic and optical microscopes. Results: Images taken by atomic force microscopy from different layers of the DVD were shown that the specific layer was better than other and was a good selection to create a nuclear track. In addition, comparing the tracks created by the optical and atomic force microscopy, indicates that DVD is a good instead for CR-39 to study the dosimeter of ionizing radiation. Discussion: Tracks in the DVD with chemical etching by 6N Sodium Hydroxide solution at 70°C will be visible first after 110 minutes and removed after 150 minutes. This time in the CR-39 detector with the same etching conditions used for chemical etch of DVD, is about 10 hours that represents the advantage of DVD in comparison of CR-39 In dosimetry studies

کلمات کلیدی:

Solid State Nuclear Track Detector, Chemical Etching, Dosimeters, Atomic Force Microscope, DVD

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