



3D visualisation and analysis of single and coalescing tracks in Solid state Nuclear Track Detectors

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Exposure to radon gas (^{222}Rn) and associated ionising decay products can cause lung cancer in humans (1). Solid state Nuclear Track Detectors (SSNTDs) can be used to monitor radon concentrations (2). Radon particles form tracks in the detectors and these tracks can be etched in order to enable 2D surface image analysis. We have previously shown that confocal microscopy can be used for 3D visualisation of etched SSNTDs (3). The aim of the study was to further investigate track angles and patterns in SSNTDs. A 'LEXT' confocal laser scanning microscope (Olympus Corporation, Japan) was used to acquire 3D image datasets of five CR-39 plastic SSNTD's. The resultant 3D visualisations were analysed by eye and inclination angles assessed on selected tracks. From visual assessment, single isolated tracks as well as coalescing tracks were observed on the etched detectors. In addition varying track inclination angles were observed. Several different patterns of track formation were seen such as single isolated and double coalescing tracks. The observed track angles of inclination may help to assess the angle at which alpha particles hit the detector.

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