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Functional possibilities of organosilicon coatings on the surface of CsI-based scintillators

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Abstract

It has been shown that a thin film ($15 \pm 5 \mu\text{m}$) based on organosilicon coating applied to all surface of CsI and CsI(Tl) scintillators excluding the output window, can combine the following functions: (1) covering from atmospheric effects; (2) scintillation light convertor of luminescence towards the region of higher spectral sensitivity of the photoreceiver and (3) ancillary surface for performance of operations on changing the light collection coefficient without the risk to exceed limited size tolerations. Wavelength-shifting coating effect on radiation hardness of pure CsI is discussed. After irradiation a new absorption bands appear in the range 250–300 nm mainly. So, contrary to the 310 nm emission, the energy losses for converted light remain the same.

Keywords

Cesium iodide scintillator; Spectrum shifting coating; Yield uniformity; Energy resolution