

FACTORS WHICH AFFECT ON THE VALUE OF THE α/γ -RATIO IN CsI:TI CRYSTAL

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Dependencies of the α/γ -ratio on activator concentration (C_{Ti}) and shaping time are studied for CsI-Tl crystals. It has been shown that the α/γ -ratio depends strongly on the C_{Ti} and increase from 0.19 at low concentration to 0.71 for the optimal C_{Ti} if the shaping time equals 6.4 μ s. Our results confirm completely the conclusion of Tsirlin et al. [1]. An explanation of the results given by Gwin and Murray in well known paper [2] is proposed.

The unusual effect of relatively strong increasing of light output for α -particle is revealed after crystal surface polishing. For instance it is possible to increase the α/γ -ratio from 0.4 up to limit level 0.71 by grinding and polishing. The increasing of alpha-yield and the α/γ -ratio is a temporary effect and manifests itself as better as the C_{Ti} smaller. Relaxation of a near surface layer continues some days and the α/γ -ratio reaches its natural value after two weeks. We concluded that paper [2] is not an experimental test of theoretical models known as Birks model and Murray and Meyer one [3].

1. Tsirlin Yu.A. et al. Optics and Spectroscopy. 4, No.3 (1959) 265.
2. R. Gwin and R. Murray. Phys. Rev. 131 (1963) 501.
3. Birks I.B. The Theory and Practice of Scintillation Counting // New York: Pergamon Press, 1964. - 510 p.