

OPTIMIZATION OF THE QUANTITATIVE COMPOSITION OF SCINTILLATION ADDITIVES FOR A TELLURIUM-LOADED PLASTIC SCINTILLATOR

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The paper describes the optimization of the composition of a tellurium-loaded plastic scintillator (Te-PS) for experiments on the search for neutrinoless double beta decay. Polystyrene was used as a scintillation base for Te-PS and 2,5-diphenyloxazole (PPO) and 1,4-bis(5-phenyloxazol-2-yl)benzene (POPOP) were used as scintillation additives. Complex compound of diphenyltellurium oxide and di-(2-ethylhexyl)phosphoric acid in a concentration corresponding to 1% tellurium content was used as tellurium-containing additive. The light yield and transparency of the scintillators were measured.

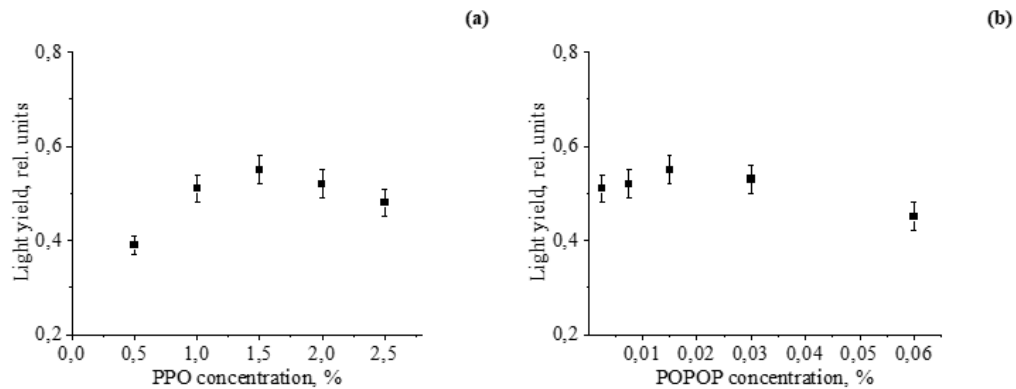


Fig.1. Light yield as a function of PPO concentration with 0.015% POPOP (a), POPOP concentration with 1.5% PPO (b) for tellurium-loaded plastic scintillators (relative to the light yield of unloaded PS)

It has been shown that the optimal PPO concentration in the scintillator is 1.5%, and varying the amount of POPOP in the studied concentration range has practically no effect on the light yield. This work is supported by a grant from the Russian Science Foundation for fundamental research and exploratory research by small individual research groups (project no. 23-22-00214).