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Study of new luminophores for use in modern scintillation cocktails

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This paper deals with the study of 1-phenyl-3-(2,4,6-trimethyl-phenyl)-2-pyrazoline, 2,2´,7,7´-tetrakis(N,N-diphenyl-amino)-9,9´-spirobifluorene, 2-(4-biphenylyl)-6-phenylbenzoxazole and 9,9´-bifluorenyl as possible replacements of the existing and most widely used luminophore (2.5-diphenyloxazole (PPO)) in contemporary scintillators. The study was focused on the determination of emission wavelength, concentration optimization, the influence of the wavelength shifters POPOP and bis-MSB. In addition, the response to alpha and beta radiation were measured, in particular, the pulse length index (PLI) was determined. Last but not least, the effect of emulsifiers on the shape of the spectrum and the solubility of the aqueous phase was tested. The results obtained were compared with the commercially available Aqualight scintillation cocktail.

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