FLUORESCENCE ABSOLUTE QUANTUM YIELDS OF POLYMETHINE DYES IN VARIOUS MEDIA

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Polymethine dyes (PD) are unique transformers of light energy. They are widely applied in laser and information technologies, photobiology etc. [1]. Depending on the PD composition and medium nature their fluorescence absolute quantum yields (FAQY) are varied wide-ranging among the known dyes. Therefore they are unique objects for examination of radiative and radiationless processes in organic molecules. Till now mainly relative values of fluorescence quantum yields were used for an estimation of the fluorescent ability of PD with sufficiently heavy difficulties and errors because of these dyes absorbed and radiated the light at the whole visible and the near infrared ranges of the spectrum. In the present paper the absolute FAQY values of two polymethine dyes (**I** and **II**) (Fig. 1) were measured for the first time in solutions and polyvinylethylal polymeric films by the modified method using an integrating sphere [2,3]. FAQY were investigated depending on the dye structure and concentration, and also on the medium nature. So, for example FAQY of **I** is variated from 0.47 up to 0.7 depending on the dye concentration and the polymeric film thickness (FAQY is 0,14 for solution **I** in toluene with concentration of 0.005%); FAQY of **II** is changed from 0.3 to 0.44 depending on the dye concentration and the polymeric film thickness.
The factors which could be caused FAQY changes under moving on from the fluid solutions to the polymeric compounds are analyzed.

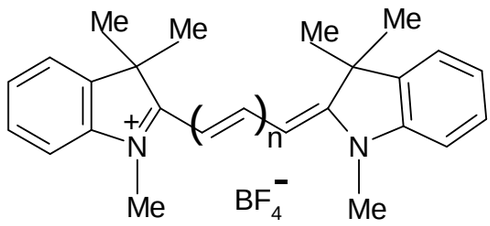

Fig. 1. The structural formulas of the investigated polymethine dyes:

I – n =1; **II –** n = 2.

References

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