

PECULIARITIES OF THE DNA – STYRYL CYANINE DYE SYSTEM LUMINESCENCE

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S u m m a r y

Fluorescence and phosphorescence of styryl dye Dbs-30 in the free state and in the presence of deoxyribonucleic acid (DNA) in the temperature range of 77–293 K are investigated. At a temperature of 77 K, the fluorescence and phosphorescence of both single chromophores and dye aggregates non-fluorescent at room temperature are registered. It is shown that there are two centers of phosphorescence in the frozen solution of Dbs-30: single chromophores and molecular aggregates. In a mixed dye-DNA solution, the quenching of the DNA macromolecule phosphorescence is observed. Furthermore, the phosphorescence and delayed fluorescence of the dye upon the excitation in the absorption band of DNA are registered. This is the evidence of the triplet electronic excitation (TEE) energy transfer from DNA to the probes bound to this macromolecule and the annihilation of such mobile T -excitations on these dyes. It is ascertained that the average mobile TEE displacement along a DNA macromolecule l_T amounts to about twenty base pairs, which confirms the estimations made using another methods [1, 2].