

1. ABSTRACT

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Title of thesis **Synthesis of low-symmetry azaphthalocyanine for the labeling of DNA probes increasing the susceptibility of the molecular-biological methods**

Azaphthalocyanines (AzaPc) are planar macrocyclic compounds. The alkylamino substituted derivatives can be used as dark quenchers in DNA-hybridization assays. A probe usually contains a quencher and a fluorophore. If these two moieties are close enough, the emitted fluorescence is quenched by the quencher. After the hydrolysis of the oligonucleotide probe, the fluorescence appears because of the long distance between the quencher and fluorophore. Thanks to the large system of conjugated double bonds, AzaPc absorb over a wide range of wavelengths from 300 nm to 750 nm. Such absorption covers all fluorophores used in hybridization assays nowadays, thus AzaPc may serve as universal dark quenchers.

The aim of this study was to prepare an AzaPc, that will be possible to attach inside an oligonucleotide strand. Furthermore, a planar moiety bounded to AzaPc will intercalate into DNA and improve the strength of binding of the probe to DNA. First, the appropriate precursors were synthesized employing either coupling reactions or nucleophilic substitution, particular reaction conditions were optimized. These precursors were then used for the synthesis of target non-symmetrical AzaPc by statistical condensation under Linstead conditions.