1 SUMMARY

This dissertation thesis deals with searching of structurally new non-fluorescent quenchers of fluorescence, which may be used for preparation of molecular probes. These potential quenchers are derived from asymmetrically substituted alkylaminoderivatives of tetrapyrazinoporphyrazines – azaphthalocyanines. As the part of this work is preparation of precursors – 5,6-disubstituted pyrazine-2,3-dicarbonitriles. They are starting material for the preparation of final substances – tetrapyrazinoporphyrazines bearing different functional moieties.

In total were prepared:

14 intermediates (3 of them have been described in our department)

13 final tetrapyrazinoporphyrazines (1 of them has been described in our department)

1 modified solid phase suitable for synthesis of marked oligonucleotides

2 by-products

23 undescribed compounds were prepared. Synthesis of 4 substances was not successful.

Final products were tested for their singlet oxygen quantum yields, stability in solutions used for synthesis of oligonucleotides and subsequently ability of quenching of commercially available fluorofor Cy5®. This ability was compared with commercially available quencher Black Hole Quencher-2®. As a part of this work is confirmation of distribution of congeners arising during the statistical tetramerization of precursors by HPLC method with UV-vis detection. The kinetic of formation of complexes with pyridine was measured. AzaPcs have weak *N*-acids properties and can complex with two molecules of weak bases, in my case with pyridine. This is link together with change of symmetry and change of colour of solution of AzaPc.

This new application of azaphthalocyanines is patent pending.