

3. ABSTRACT

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Title of Thesis: Synthesis of arylsulfanyl phthalocyanines and their aza-analogues.

Phthalocyanines (Pcs) and their aza-analogues (AzaPc), chemical substances used in photodynamic therapy, are characterized by interesting photophysical properties which may substantially vary in dependence on the character of peripheral substituents. For example, sum of singlet oxygen and fluorescence quantum yields reaches typically a value of 1 for Mg and Zn complexes while is significantly decreased for metal-free derivatives. It has been suggested from several previous experiments that this effect can be influenced by bulkiness of the peripheral substituents.

The aim of this work was the synthesis of bulky 2,6-diphenylphenylsulfanyl substituted Pcs and AzaPcs with subsequent study of their photophysical properties.

The synthesis started from 2,6-diphenylphenol, a commercially available substance, which was converted to corresponding *O*-carbamothioate with dimethylcarbonylchloride. Isomeric *S*-carbamothioate was prepared using Newman-Kwart rearrangement at high temperatures and then reduced to corresponding thiol with LiAlH₄. 2,6-Diphenylphenylthiol was used for the nucleophilic substitution of two dicyanide precursors with pyrazine and a benzene ring. Subsequent cyclotetramerization and following exchange of the central cations led to the Pc and AzaPc macrocycles bearing different central atoms (Mg, 2H, Zn) that were subject of the following photophysical study. Tendency of Pcs and AzaPcs to aggregation in toluene was also evaluated.