

ABSTRACT

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Title of Rigorous Thesis	Synthesis and Study of Spectral and Photophysical Properties of a New Water-soluble Azaphthalocyanine Bearing Saccharide Units on the Periphery

Azaphthalocyanines (AzaPc), the aza-analogues of phthalocyanines are macrocyclic compounds with large conjugated system giving them interesting spectral and photophysical properties useable in photodynamic therapy. An important condition for their use in this application is to provide solubility in an aqueous medium without losing their photodynamic activity. Water solubility can be achieved by the introduction of hydrophilic substituents on the periphery of the macrocycle. Hydrophilic substituents may be charged (anionic, cationic) or uncharged (e.g. hydroxyl-bearing).

The aim of this thesis was to prepare and to study the properties of the water-soluble AzaPc bearing uncharged substituents on periphery, concretely saccharide unit, leading to AzaPc with 32 hydroxyl groups on the periphery. Zinc was chosen as the central metal because the zinc AzaPc are stable and responsible for good photophysical properties.

Isopropylidene protected 6-deoxy-6-thio-D-galactopyranose was prepared according to published procedure in the first part of this work. It subsequently provided desired precursor by nucleophilic substitution with 5,6-dichloropyrazine-2,3-dicarbonitrile. This precursor was cyclotetramerized using template method with zinc acetate in anhydrous dimethylformamide. The last step of this thesis was deprotection of the protecting groups on the saccharide units under highly acidic conditions.

Prepared AzaPcs were studied in terms of spectral and photophysical properties.