

ABSTRACT

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| Department | Department of Pharmaceutical Chemistry and Pharmaceutical Analysis |
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| Title of Thesis | Synthesis and study of subphthalocyanines axially modified by amino adamantyl |

Photodynamic therapy is a promising approach for cancer treatment that relies on the administration of a photosensitizer, followed by illumination of the tumor. The generated oxidative stress subsequently activates several mechanisms of cell death. One of the novel groups of photosensitizers are subphthalocyanines with a conical π surface, which renders them less prone to aggregation and offers the possibility to tune their properties through axial substitution (aside peripheral modification). Due to the lipophilicity of the macrocycle, it is necessary to increase its water solubility. This work focused on the possibility of forming supramolecular host-guest complexes with hydrophilic macrocycles in order to increase the hydrophilicity of a subphthalocyanine. In particular, cucurbituril-7 (CB[7]) was chosen since it forms one of the most stable supramolecular interactions in water with 1-aminoadamantane, which was therefore proposed as the axial substituent on subphthalocyanine core.

Synthesis of the originally intended compounds with ethylsulfanyl moieties at the periphery failed. Therefore, alternative structures bearing iodine as peripheral substituents were designed. They were successfully prepared *via* cyclotrimerization of the respective phthalonitriles with boron trichloride, and subsequent nucleophilic substitution of chlorine by aminoadamantane derivatives. Their photophysical properties and host-guest interactions with CB[7] were investigated.