

ABSTRACT

Charles University, Faculty of Pharmacy in Hradec Králové

Department Department of Pharmaceutical Chemistry and Pharmaceutical Analysis

Candidate Eliška Sikorová

Supervisor PharmDr. Jiří Demuth, Ph.D.

Title of Thesis Synthesis and study of supramolecular properties of azaphthalocyanines usable as sensors

Azaphthalocyanines are planar aromatic macrocycles that were derived from natural porphyrins. The basic skeleton consists of four isoindole units which are linked at positions 1 and 3 by azamethine bridges, resulting in an extensive system of conjugated double bonds that give these compounds unique optical and electrical properties. Azaphthalocyanines are widely used as industrial dyes, conductors, photosensitizers in photodynamic therapy, fluorescence quenchers or fluorescence sensors, etc. The compounds synthesized during this thesis can be used as an interesting type of sensors for sensing coordination analytes in solution. That is why this work deals with the study of the supramolecular properties of the synthesized compounds, in particular the ability to form J-dimer type aggregates, which are formed by coordination of the peripheral pyridyl nitrogen to the central zinc cation of the second azaphthalocyanine. J-dimers resemble a „step-like“ arrangement in contrast to the second type of aggregation, namely H-dimers resembling a „sandwich“. The strength of the interaction between the peripheral nitrogen of one compound and the central cation of the other is strongly influenced by the bulkiness of the peripheral substituent. This can be supported by the absorption and emission spectra of the last prepared compound with hexakis[(2,6-diisopropyl)phenylsulfanyl] substituent which formed almost no dimers.

