

# ABSTRACT

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Rigorosum thesis: Aminoazaphthalocyanine peripheral substitution effect on J-dimer formation

Azaphthalocyanines (AzaPcs) are classified as subgroup of phthalocyanine family, which are planar synthetic macromolecules derived from naturally occurring porphyrins. AzaPcs are aza-analogues of phthalocyanines, where benzenes are isosterically replaced by nitrogen heterocycles (pyrazine, pyridine or pyridazine). Due to the extensive system of conjugated double bonds, AzaPcs exhibit interesting photophysical properties, for which they are commonly used as industrial dyes, photosensitisers in photodynamic therapy, fluorescent sensors, fluorescence quenchers etc. Octakis(dialkylamino) substituted tetrapyrazinoporphyrazines (TPyzPzs), which belong to the AzaPcs family, can be used as effective fluorescence quenchers due to their ability to relax from excited state by intramolecular charge transfer (ICT) that leads to zero intrinsic fluorescence. This thesis deals with the preparation and subsequent study of the properties of symmetric TPyzPzs. Above all, the ability of TPyzPzs to form aggregates of the J-dimer type is studied. Although this type of aggregation is not typical for compounds from the phthalocyanine family, it can positively affect the photophysical properties of macrocycles. The formation of J-dimers is caused by the coordination of peripheral amino groups to the central zinc cation of the second molecule. The strength of this interaction is greatly influenced by the size and bulkiness of the used peripheral substitution which was the scope of this work.