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Title of thesis **Syntheses of azaphthalocyanine fluorescence sensors with the improved selectivity towards desired metal cations**

Azaphthalocyanines (AzaPc) bearing aza-crowns on the periphery may be used as fluorescence sensors for metal cations. Emission in the red part of the spectrum is a great advantage of these compounds because such light is not absorbed by endogenous chromophores. Previous projects served mostly as a proof of concept where sensitivity of AzaPc sensors to a series of alkali and alkaline earth metal cations was shown. The aim of this diploma thesis is focused on the improvement the selectivity of a recognition moiety for particular cations. This can be achieved by the attachment of lariat ethers or crown ethers close to aza-crown moiety.

Firstly, appropriate precursors, i.e. 5,6-disubstituted pyrazine-2,3-dicarbonitriles, were prepared by nucleophilic substitution. Then, cyclotetramerization of two different precursors (A and B) using a template method with zinc acetate in a high boiling solvent provided a statistical mixture of AzaPc congeners. Desired unsymmetrical AzaPc of ABBB type was chromatographically separated. Finally, sensoric properties of prepared AzaPcs were studied by the mean of fluorescence titration experiments, which revealed improved selectivity for potassium cations together with insensitivity to other cations studied (Na^+ , Li^+ , Ca^{2+} , Mg^{2+}).