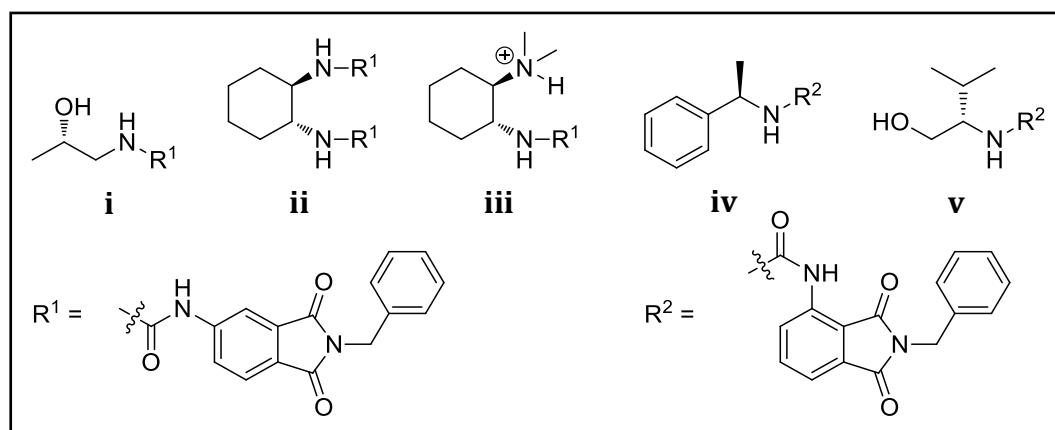


Abstract

In the present thesis, five new phthalimide-urea conjugates **i-v** with chiral moieties were synthesized and characterized photophysically (scheme 1). All synthesized phthalimide-urea conjugates **i-v** exhibit broad and unstructured fluorescence emission bands around 400 - 500 nm with emission maxima and fluorescence quantum yields that show strong solvent dependence.



Scheme 1: Phthalimide urea conjugates **i-v** synthesized and investigated in this thesis.

By means of fluorescence, UV-Vis, TCSPC and $^1\text{H-NMR}$ spectroscopy, the interactions of these new chiral ureido phthalimides **i-v** with the achiral anions fluoride, acetate and dihydrogenphosphate as well as with the enantiomers of the achiral anions lactate, aspartate, glutamate, Boc-aspartate, Boc-glutamate, malate and tartrate were analyzed. Thereby, the phthalimide-urea conjugates **i-v** were investigated with regard to their abilities to detect the employed anions in solution and to enable enantiodifferentiation of the chiral anions.

In an additional part of this thesis, the phthalimide-urea conjugate **iii**, which has been proven to be promising through the results obtained above, was employed as a chiral template in the [4+4]-photocyclodimerization of 2-anthracene carboxylate. Irradiation experiments of 2-anthracene carboxylate in the presence of the ureido phthalimide **iii** were performed in various reaction media as well as at several temperatures and the product distributions were analyzed. The enantioselectivity of the dimerization was attributed to specific interactions of 2-anthracene carboxylate with the phthalimide-urea conjugate by means of UV-Vis and CD spectroscopy.