In recent years there appeared OLED screens, in which light emission comes from organic molecules. However currently used light-emitting materials have some disadvantages. These are limited durability and non-completely used spectroscopic properties. One way to improve useful features of OLED panels is using materials that can emit circularly polarized light (CPL). Organic molecules, which are able to emit CPL, are currently intensively exploited. Most of them are acyclic molecules, but there show up more experiments with use of macrocyclic compounds. Scientists from Organic Stereochemistry Group work on synthesis of chiral macrocycles for many years. Most of these are based on terephthaldehyde derivatives and (*R*,*R*)-1,2-diaminocyclohexane (DACH).

In research presented in this thesis, terephthaldehyde derivatives are source of fluorescence. All of these were obtained from 2,5-bromoterephthaldehyde. Atoms 2 and 5 in aromatic rings were substituted with chromophore groups: triphenylamine and phenylcarbazol in Suzuki coupling. Both of the groups were joined in three ways, in order to diversify optical properties of final products. All of the six derivatives react with DACH (both with absolute configurations *R*,*R* and *S*,*S*) to give macrocycles from three molecules of dialdehyde and three molecules of diamine.

In order to better understand chiraloptical and fluorescent properties of the macrocycles, apart from twelve macrocycles, there was prepared series of acyclic imines, based on the same terephthaldehyde derivatives and simple, chiral monoamines. After obtaining and examining several model compounds, two of them were more precisely examined, to claim whether they can be applied as chromophoric probes.