

## Abstract

The aim of this bachelor thesis is to synthesize and study new kind of macrocyclic ligands for  $\text{Ln}^{3+}$  ions containing nuclei  $^{19}\text{F}$  for using as possible contrast agents in  $^{19}\text{F}$  magnetic resonance imaging.

Prepared ligands were designed as analogues of already known ligands for  $\text{Ln}^{3+}$  ions, which are used in clinical practice. Both designed ligands were successfully prepared.

Complexes  $[\text{Ln}^{\text{III}}(\text{dotp}^{\text{tfe}})]^-$  were prepared and their structure in aqueous solution was predicted by NMR studies and luminescence spectroscopy.  $T_1$  relaxation times of nuclei  $^{19}\text{F}$  in complexes  $[\text{Ln}^{\text{III}}(\text{dotp}^{\text{tfe}})]^-$  and ligand  $\text{DOTP}^{\text{tfe}}$  were determined.