

## Abstract

Presented diploma thesis describes synthesis of novel  $\alpha,\omega$ -bis(terpyridyl)-bithiophenes and  $\alpha,\omega$ -bis(terpyridyl)terthiophenes with alkyl substituents on thiophene rings. The  $\alpha,\omega$ -bis(terpyridyl)oligothiophenes were prepared using Suzuki-Miyaura coupling of 4'-(5-bromo-3-alkylthien-2-yl)terpyridine with 2,5-thiophenediboronic acid and 2,2'-bi(1,3,2-dioxaborolane), respectively. The successful transformation of 4'-(5-bromo-3-alkylthien-2-yl)terpyridine to corresponding bis(terpyridyl)oligothiophenes was confirmed by NMR and HR-MS analyses and IR spectroscopy.

UV-vis spectroscopy, excitation and emission photoluminescence (supplemented with determination of photoluminescence quantum yields) and cyclic voltammetry were used to study spectroscopic and redox properties of novel  $\alpha,\omega$ -bis(terpyridyl)oligothiophenes and previously prepared unsubstituted  $\alpha,\omega$ -bis(terpyridyl)bithiophene and  $\alpha,\omega$ -bis(terpyridyl)terthiophene.

Interaction of zinc ions with ligands soluble in tetrahydrofuran was studied using UV-vis spectroscopy and emission photoluminescence spectroscopy.

Main-chain supramolecular polymers were successfully prepared from four soluble ligands and zinc ions. Properties of prepared polymers were studied using UV-vis spectroscopy, excitation and emission photoluminescence spectroscopy and IR spectroscopy.

### Keywords:

Terpyridine, oligothiophenes, supramolecular polymer, self-assembly, zinc