NOVEL CHIRAL LIGANDS AND THEIR METAL COMPLEXES
BASED ON SUBSTITUTED IMIDAZOLYLPYRIDINES

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In recent years, it intensively increases development of synthesis and characterisation of new chiral ligands and their transition metal complexes. These complexes are especially used as a homogeneous catalysts in asymmetric synthesis. Main advantage of our N,N-bidentate ligands is impossibility of their racemisation as in case oxazolines. These new ligands were prepared analogous to 2,6-bis(4-isopropyl-4-methyl-4,5-dihydro-1H-imidazol-5-on-2-yl)pyridines described in our previous paper [1], from optically pure 2-amino-2,3-dimethylbutanamides and ethyloxy carbonyl pyridine 2-carboxylic acid, followed by subsequent ring closure reaction giving 4,5-dihydro-1H-imidazol-5-one. The last step was N-alkylation of 4,5-dihydro-1H-imidazol-5-one by different alkylation agents. Ligands prepared in this way were characterised using 1H and 13C NMR spectroscopy.

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\begin{align*}
\text{R: CH}_3, \text{CH}_3\text{Ph}, \text{CH}_2\text{-2-Py}, \text{CH}_2\text{CN}, \text{CH}_2\text{CO}_2\text{CH}_2\text{CH}_3, \text{CH}_2\text{CO}_2\text{NH}_2
\end{align*}
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Finally were prepared complexes of ligands with cobalt(II) and copper(II) salts, which structures were confirmed by X-ray diffraction. These metal complexes were used as enantioselective catalysts for Henry’s reaction [2]. Coordination reaction of ligand (R = CH2Ph) with anhydrous CoCl2 forms complex with dimeric structure however in the case of ligand (R = CH3) it forms complex with monomeric structure.

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Literature: