

The 2,2'-disubstituted 1,1'-binaphthyls (BINOLs) are important ligands in enantioselective synthesis. The major approach for their preparation is based on transition-metal-mediated oxidative C-C coupling of 2-substituted naphthalenes. This diploma thesis examined the mechanism of the coupling reaction in the gas phase using mass spectrometry with electrospray ionization. The aim of this thesis was to compare the selectivity of the copper(II)-catalyzed coupling reaction of 2-naphthol and its derivative with an electron-withdrawing group, to detect possible reaction intermediates, and to determine the origin of the preference of the cross-coupling. The electron-withdrawing group of naphthol slows down the coupling reaction which enabled us to detect the reaction intermediates. The intermediates in the reaction of 2-naphthol were not observed, because the coupling reaction proceeds too quickly. Hence, we have observed only complexes of the coupling products. The preferential cross coupling was explained on the basis of an interplay between the probability of the formation of binuclear copper complexes and the reactivity of such complexes.