

Abstract

The current dissertation thesis is focused on the investigation of metal-catalyzed reactions using electrospray ionization mass spectrometry as the primary research technique. However, other gas-phase methods such as tandem mass spectrometry, infrared multiphoton dissociation spectroscopy and quantum chemical calculations have also been involved to unravel and support the findings and proposals. As organometallic chemistry is a very broad and complicated topic, this thesis is only focused on a few projects. The first of them is dedicated to copper acetate speciation in organic solvents, the second - to the mechanistic investigation of copper catalyzed aerobic cross coupling of thiol esters and arylboronic acids, the third studied coordination and bond activation of nickel(II) – phenylpyridine complexes and the last investigated carboxylate assisted C-H activation reactions.