

The main focus of the current dissertation thesis is research of gold catalyzed reactions. I was using mass spectrometry as the primary research technique. I complemented the results with infrared multiphoton dissociation spectroscopy, nuclear magnetic resonance spectroscopy and quantum chemical calculations. I have investigated the interaction of the gold(I) cation with unsaturated hydrocarbons in the first part of my thesis. Secondly, I have studied gold(I) or silver(I) affinity to gold acetylides. In the last part, I have investigated the reaction mechanism of a gold mediated addition of methanol to alkynes. I found out that the gold(I) cation interacts stronger with gold acetylides than with nonactivated triple CC bonds. I showed that the complexes containing two gold atoms represent the key intermediates in the mechanism of addition of methanol to alkynes and that the ligand on the gold catalyst plays a fundamental role in the determination of the mechanism.