

Abstract

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Title of thesis: The application of cycloisomerization and cycloaddition for the building of polycyclic scaffolds

This diploma thesis deals with the use of gold-catalyzed cyclizations and Diels-Alder reactions in the preparation of complex cyclic structures. In the introductory part, the use of gold as a catalyst is discussed, especially in the cyclizations of double and triple bond containing compounds (enynes). This is followed by a review of the utilization of Diels-Alder cycloaddition in organic synthesis. The actual experimental work deals with the synthesis of tetrahydropyridine with vinyl substitution by Au(I)-cyclization and the use of this compound as a diene for the Diels-Alder reaction. For the synthesis of substituted tetrahydropyridine, 2 possible routes of preparation of starting compound for cyclization using Michael addition and Sonogashira cross-coupling were utilized and compared. The resulting tetrahydropyridine was subsequently subjected to various Diels-Alder reactions, to expand the chemical library with isomeric derivatives of isoquinoline, pyrrolo[3,4 h]isoquinoline and pyrano[2,3-*c*]pyridine.

Keywords: cyclisation reactions, gold catalysis, Diels-Alder reactions, isoquinolines