Title: Synthesis of Allenes via Elimination of *β*-Ketosulfones

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ABSTRACT

Allenes are a unique group of organic compounds due to the presence of two cumulated double bonds. Their rich chemistry is exploited in the synthesis of complex organic compounds, including macrocycles and heterocycles. Allenes are frequently used as intermediates in the synthesis of natural compounds and pharmaceuticals. They have a considerable synthetic potential, but due to the limited number of universal and practical methods of their synthesis, new approaches to allenes are constantly sought.

There are only few ways to synthesize allenes in which substrates other than propargyl alcohols are used or transition metals are not employed. One of them is elimination reaction. Most of the known methods are based on the use of substrates containing a leaving group bound with C=C double bond. Far fewer are those where the leaving group is on aliphatic carbon atom.

In this work the studies on the new method of allene synthesis in the base-induced elimination reaction are described. The proposed method is based on the Julia-Kocieński olefination reaction. In this approach, so far unknown, heteroaryl *β*-ketosulfones containing a quaternary *α*-carbon are used, which leads to the formation of allenes instead of alkenes or alkynes as in the case of the calssical Julia-Kocieński reaction.

This work consists of three chapters. The first chapter describes the most common methods of synthesizing allenes, e.g. rearrangement, homologation, nucleophilic substitution, elimination and transition metal-catalyzed reactions. The second chapter describes studies on the preparation of *β*-ketosulfones containing various aryl groups, as well as studies on the development of the new allenes synthesis method in the elimination reaction of *β*-ketosulfones. The third chapter is a description of experiments performed during the studies, and analytical data of the obtained compounds.

During the studies, a highly regioselective method of allene synthesis was developed. It allows to obtain the target compounds under very mild conditions in the presence of a weak base and without transition metals. The developed method has been successfully applied to the preparation of variously substituted allenes. Importantly, the developed reaction was proved to be stereospecific and applied in an enantioselective allene synthesis with the use of a chiral auxiliary.