

Application of the Paternò-Büchi Reaction to the Synthesis of Novel Fluorinated Scaffolds.

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Photochemical reactions are extensively applied to organic synthesis [1,2]. In recent years, photochemical reactions have become a common tool in modern organic chemistry laboratories since they enrich the chemical space available at the ground state, for example in the search for biological active molecules [1,2,3].

The Paternò-Büchi reaction is a [2+2] photocycloaddition between an electronically excited carbonyl compound and an alkene, leading to oxetanes [4]. Despite the fact that this reaction is one of the most extensively researched organic photochemical reactions (mechanism, regio-, stereo- selectivities) little is known about the use of heteroaromatic ketone partners for this photocycloaddition. In the context of the search for biological activity, we investigated the application of the Paternò-Büchi reaction to the synthesis of new scaffolds using simple and inexpensive ketones and olefins [5]. In this communication, we present our recent results concerning the Paternò-Büchi reaction using benzoyl pyridines and furan as the olefin partner.

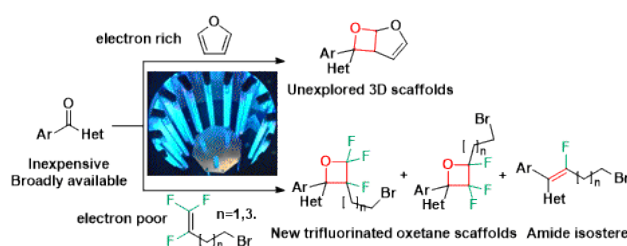


Figure 1: Application of the Paternò-Büchi reaction using heteroaromatic ketones, electron rich and electron poor olefins.

In parallel studies, the reactivity of aromatic and heteroaromatic ketones with fluorinated olefins was investigated in detail (Figure 1). The stability of the fluorinated oxetane product depends on the substitution of the aromatic ring. A subsequent methathesis-like reaction (photo-Wittig reaction) yields amide isosteres.

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