OP-23

STRUCTURE–REACTIVITY CORRELATION IN THE REACTION OF MIXED PHOSPHONIUM-IODONIUM YLIDES WITH ACETYLENES

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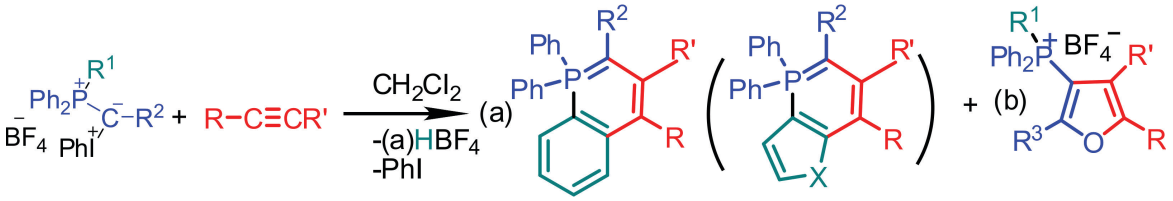
Mixed phosphonium-iodonium ylides **1** (R^1 = Ph or five-membered heterocycle) interact with acetylenes **2** according to Scheme giving either P-containing heterocycles **3** and furan derivatives **4**, when R^2 = C(O)Ph, C(O)OMe and C(O)OEt, or P-containing heterocycles **3**, when R^2 = $PO(OEt)_2$, CN, $S(O)_2(p\text{-}MeC_6H_4)$.[1–3]



1 **2** **3** **4**

In the former case the ratio of the yields for heterocycles **3** and **4** depends on the relationship between the ionizations potential (IP) of an acetylene and the electron affinity of an ylide: for a given ylide the lower IP of the acetylene the higher yield of furan **4**. In both cases the yields of the target heterocycles depend on the ylide structure and the reaction conditions. For certain ylide–acetylene pairs the reaction proceeds only under the action of light, for the others the reaction does not require irradiation. The involvement of radicals in the initiation of the reaction (inhibition with TEMPOL) and in the formation of the products (CIDNP effect) are shown.[4] The mechanism of acid catalysis is established.[5]

In this presentation the reaction mechanism will be discussed with special attention being drawn on the role of the structure of both reactants on the yield of the target heterocycles.

Acknowledgement. This study is supported by the RF State Program no. 1201253303.

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