2,3-Dihydro-benzo[*f*][1,4]oxazepines as a novel substrates for Castagnoli-Cushman reaction

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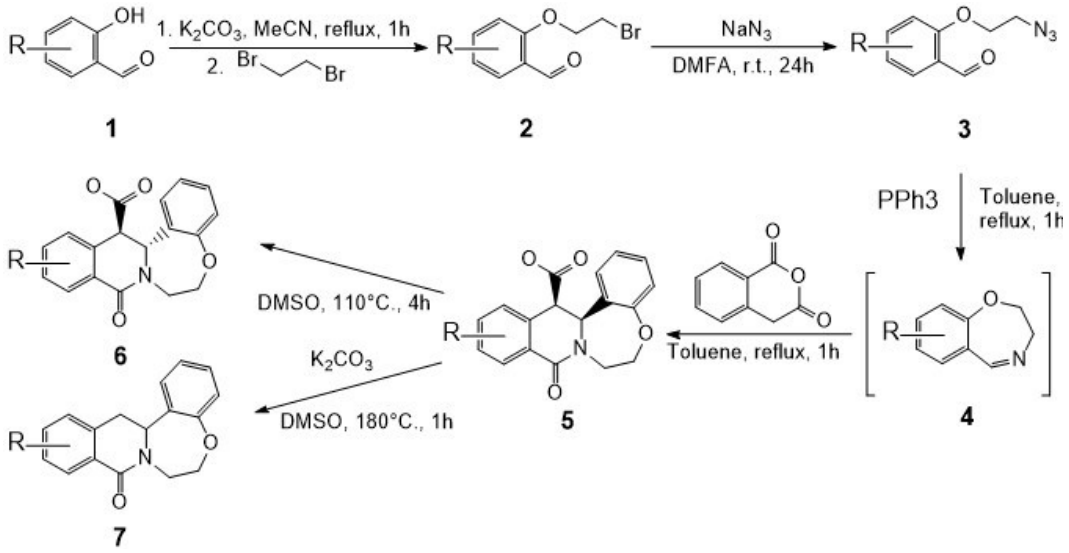
Due to wide application and popularity of heterocycles in medicinal chemistry development of convenient approaches to new heterocyclic scaffolds appears to be an actual scientific problem. Castagnoli-Cushman reaction is a powerful synthetic instrument for *N*-heterocycles construction. Generally, this reaction represents interaction of cyclic anhydrides with imines. [1] In this work we report a novel one-pot approach including *in situ* generation of 2,3-dihydro-benzo[f][1,4]oxazepines (scheme 1, **4**) combined with Castagnoli-Cushman reaction.

2,3-Dihydro-benzo[f][1,4]oxazepines (scheme 1, **4**) are scarsly studied N,O-containing bicyclic imines. We propose *in situ* synthesis of these compounds from 2-(2-azidoethoxy)benzaldehydes (scheme 1, **3**) via the intramolecular aza-Wittig reaction. (scheme 1, **3-4**) Synthesis of 2-(2-azidoethoxy)benzaldehydes includes two steps giving good overall yields. (scheme 1, **1-3**). These aldehydes quantitatively convert into imines in toluene solution under the action of Ph_3P. (scheme 1, **3-4**) Thus *in situ* generated imines proved to be suitable for the Castagnoli-Cushman reaction. This allowed performing the one-pot synthesis of the target polycyclic lactams, which were isolated in good to high yields as a single *cis*-diastereomer. It was shown that heating in DMSO leads to quantitative isomerization to *trans*-form. (scheme 1, **5-6**) Moreover, we report on the efficient decarboxylation procedure of Castagnoli-Cushman products. (scheme 1, **6-7**)



Scheme 1.Synthesis of polycyclic lactams (**5**, **6**, **7**) through *in situ* generation of 2,3-dihydro-benzo[f][1,4]oxazepines (**4**)

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References

1. Krasavin M., Dar'in D. V., Current diversity of cyclic anhydrides for the CastagnoliCushman-type formal cycloaddition reactions: prospects and challenges // Tetrahedron Letters. 2016, Vol. 57. P. 1635-1640.