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PII: S0040-4039(16)30349-5
DOI: http://dx.doi.org/10.1016/j.tetlet.2016.04.008
Reference: TETL 47508

To appear in: *Tetrahedron Letters*

Received Date: 2 February 2016
Revised Date: 30 March 2016
Accepted Date: 5 April 2016

Please cite this article as: Li, C., Cai, L-Z., Liu, X-D., Zhu, S-Z., Xing, C-H., Lu, L., Highly Efficient Synthesis of Tetrasubstituted 2, 3-Dihydropyrans by Three-component 'One-pot' Reaction, *Tetrahedron Letters* (2016), doi: http://dx.doi.org/10.1016/j.tetlet.2016.04.008

Highly Efficient Synthesis of Tetrasubstituted 2, 3-Dihydropyrans by Three-component 'One-pot' Reaction

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Abstract

With ammonium acetate as catalyst, three-component 'one-pot' reaction of β-keto perfluoroalkanesulfones, aldehydes and vinyl ethers proceeded smoothly and afforded tetrasubstituted 2, 3-dihydropyrans in moderate to excellent yields. Both aromatic and aliphatic aldehydes, as well as cyclic vinyl ether are compatible with this methodology. All dihydropyran products were obtained as *cis*- and *trans*-diastereomeric mixtures. The relative configurations were established by comparing the coupling constants of anomeric protons of both isomers and confirmed by single-crystal X-ray diffraction analysis.

Keywords: Dihydropyran, Perfluoroalkanesulfone, α, β-Unsaturated ketone，Hetero Diels-Alder reaction, Three-component

Owing to its strong electron-withdrawing property and multiple reactivity, sulfonyl groups display manifold roles in reactions and thus serve as a powerful synthetic tool for constructing various compounds in organic chemistry.[1-3] Among all sorts of sulfonyl groups, perfluoroalkanesulfonyl R_fSO_2 shows somewhat extraordinary characters due to the strongly electron-withdrawing inductive effect of the perfluoroalkyl group.[4-6]

In our continuing efforts on studying perfluoroalkanesulfone compounds, we have