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Simple Syntheses of Polysubstituted Arenes Via Acyclic Precursors

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Summarizes the syntheses of polysubstituted arenes containing perfluoroalkyl group(s) via acyclic precursors.

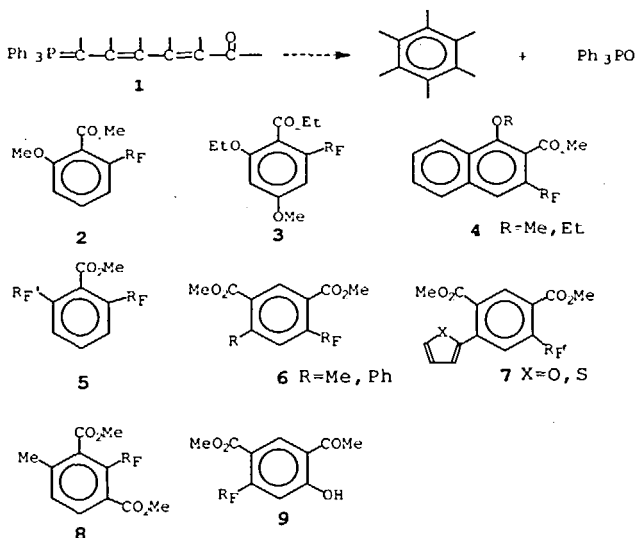
Keywords: phosphorane; polysubstituted arene; perfluoroalkynoate; acyclic precursor

INTRODUCTION

Polysubstituted arenes are important intermediates in industry of synthetic medicines and dyestuffs, their fluoroalkylated analogues are more attractive as a result of the lipophilicity, electronegativity and the relatively small size of the fluoroalkyl group^[1,2]. However, their preparations using the classical aromatic substitution reaction suffered from long synthetic routes, difficult to separate the positional isomers and hard to introduce the fluoroalkyl group^[3]. Therefore, to study the convenient and efficient syntheses of fluorinated polysubstituted arenes is valuable in organic synthetic methodology. Recently, we had reported the syntheses of fluoroalkylated polysubstituted arenes through the addition of a phosphorane to a perfluoroalkynoate producing an acyclic precursor(**1**) possessing a conjugated six-carbon main chain with a terminal carbonyl group, when undergo intramolecular elimination of Ph_3PO to afford polysubstituted aromatic compound. Several types of tri- and tetra-substituted aromatic compounds(**2-9**) were synthesized by using this method^[4-10]. It is a facile and

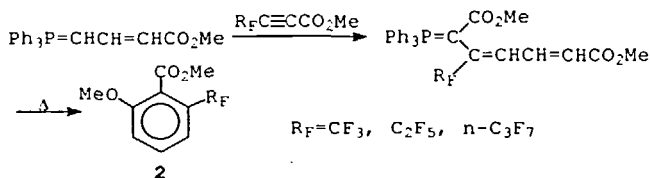
efficient method attributing to its simplicity and the production of only a sole product with functional groups at definite positions.

To synthesize polysubstituted arenes, the key step is to prepare the acyclic precursor---a phosphorane with a conjugate six-carbon main chain and a terminal carbonyl group. We have designed [4+2], [3+1+2] and [2+2+2] modes to get the precursor. Polysubstituted arenes were obtained by heating the precursor in certain solvent.

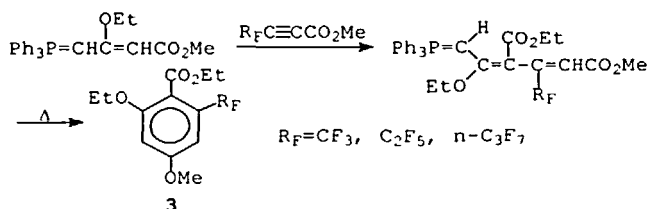


[4+2] MODE

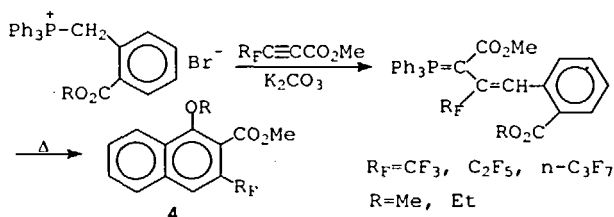
1. Synthesis of Methyl 2-Perfluoroalkyl-6-methoxybenzoates



2. Synthesis of Ethyl 2-Ethoxy-4-methoxy-6-perfluoroalkyl-benzoates

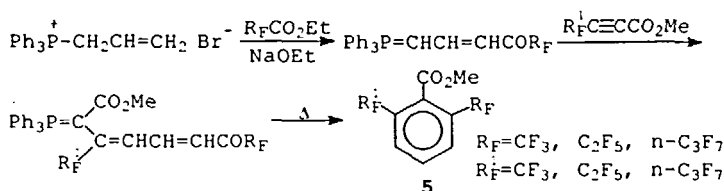


3. Synthesis of Methyl 1-Alkoxy-3-perfluoroalkyl-2-naphthoates



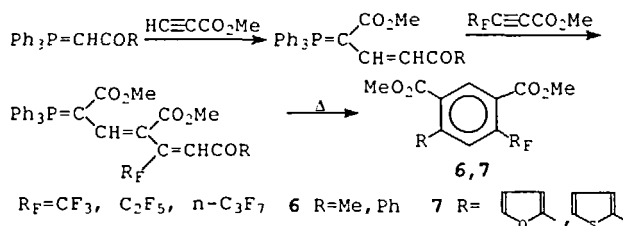
[3+1+2]MODE

1. Synthesis of Methyl 2,6-Bisperfluoroalkylbenzoates

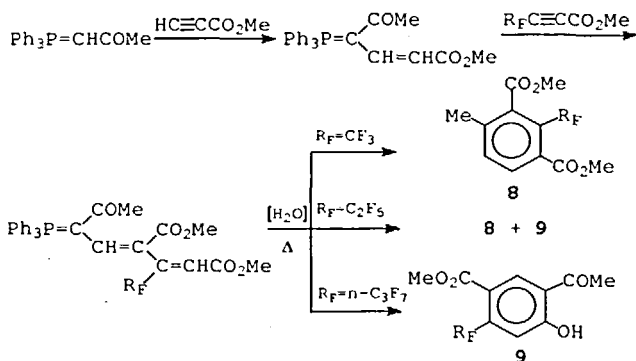


[2+2+2]MODE

1. Synthesis of Dimethyl 5-Perfluoroalkylbiphenyl-2,4-dicarboxylates and Dimethyl 4-Methyl-, 4-(α -Furyl)- and 4-(α -Thienyl)-6-perfluoroalkylisophthalates



2. Synthesis of Dimethyl 3-Perfluoroalkyl-4-(3-oxo-2-triphenylphosphoranylidene)-pent-2-enedioate and Its Cyclization



Acknowledgements

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References

- [1] *Organofluorine Chemicals and Their Industrial Application*, Ed.Banks, R.E., Ellis Harwood Ltd., 1979.
- [2] a) J.T. Welch, *Tetrahedron*, **43**, 3123(1987). b) Mann, *J. Chem. Soc. Rev.*, **16**, 381(1987).
- [3] M.A. McClinton and D.A. McClinton, *Tetrahedron*, **48**, 6555(1992).
- [4] W.-Y. Ding, P.-S. Zhang and W.-G. Cao, *Tetrahedron Lett.*, **28**, 81(1987).
- [5] W.-Y. Ding, J.-Q. Pu and C.-M. Zhang, *Synthesis*, 635(1992).
- [6] W.-Y. Ding, W.-G. Cao, Z.-R. Xu, Z.-J. Shi and Y. Yao, *Chin. J. Chem.*, **11**, 81(1993).
- [7] W.-Y. Ding, W.-G. Cao, Z.-R. Xu, Y. Yao and Z.-J. Shi, *J. Chem. Soc., Perkin Trans. I*, 855(1993).
- [8] W.-Y. Ding, W.-G. Cao, Y. Yao and Z.-M. Zhu, *Chin. J. Chem.*, **13**, 468(1995).
- [9] W.-G. Cao, W.-Y. Ding, T. Yi and Z.-M. Zhu, *J. Fluorine Chem.*, **81**, 153(1997).
- [10] W.-G. Cao, W.-Y. Ding, W.-L. Ding and H. Huang, *J. Fluorine Chem.*, **83**, 21(1997).