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SYNFACTS Highlights in Current Synthetic Organic Chemistry

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Georg Thieme Verlag KG
Rüdigerstraße 14
70469 Stuttgart
ISSN 1861-1958

Thieme

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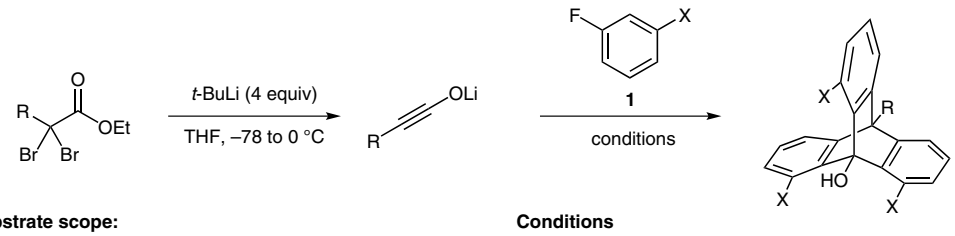
Regioselective One-Pot Synthesis of Triptycenes via Triple-Cycloadditions of Arynes to Ynolates
Angew. Chem. Int. Ed. **2017**, *56*, 1298–1302.

Three Benzynes and the Ynolate



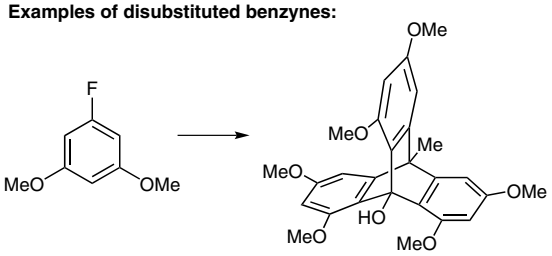
Substrate scope:

Entry	R	X	Conditions	Yield (%)
1	Me	H	A	42
2	*i*-Pr	H	A	35
3	*n*-Bu	H	A	52
4	*t*-Bu	H	A	39
5	Ph	H	A	27
6	Me	OMe	B	69
7	*i*-Pr	H	A	39
8	*n*-Bu	OMe	B	48
9	Hex	OMe	B	37
10	Ph	H	A	37

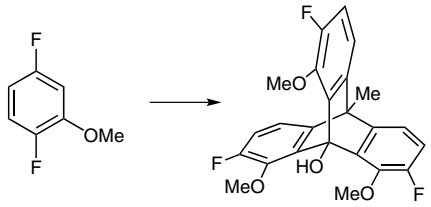
Conditions

A: **1** (6 equiv), then *n*-BuLi (4 equiv) addition over 1 h
B: **1** (4 equiv), then *n*-BuLi (4 equiv) addition over 5 min, –20 °C

Examples of disubstituted benzynes:



39% yield



30% yield

Significance: The triptycene structure is a remarkable scaffold that is frequently employed in functional materials as a result of its three dimensional, noncompliant structures and the interstitial space around the molecule. Most syntheses are based on a Diels–Alder cycloaddition between anthracene and an aryne. The authors describe a one-pot synthesis of triptycenes that proceeds through three cycloadditions of arynes to ynolates.

Comment: The approach of formally inserting three arynes into an alkyne is a new and powerful way to obtain both simple and substituted triptycenes. Calculations provide an insight into the mechanism and explain the high regioselectivity (head-to-head-to-head).

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Synfacts 2017, 13(03), 0253 Published online: 15.02.2017
DOI: 10.1055/s-0036-1590046; **Reg-No.:** S00617SF