Category

Synthesis of Materials and Unnatural Products

Key words

rhodium-catalyzed [2+2+2] cycloaddition

chiral bitriphenylenes

[7]helicenes

fluorenes

Y. SAWADA, S. FURUMI, A. TAKAI, M. TAKEUCHI, K. NOGUCHI, K. TANAKA* (TOKYO UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, NATIONAL INSTITUTE FOR MATERIALS SCIENCE, TSUKUBA AND SCIENCE AND TECHNOLOGY AGENCY, KAWAGUCHI, JAPAN)

Rhodium-Catalyzed Enantioselective Synthesis, Crystal Structures, and Photophysical Properties of Helically Chiral 1,1′-Bitriphenylenes

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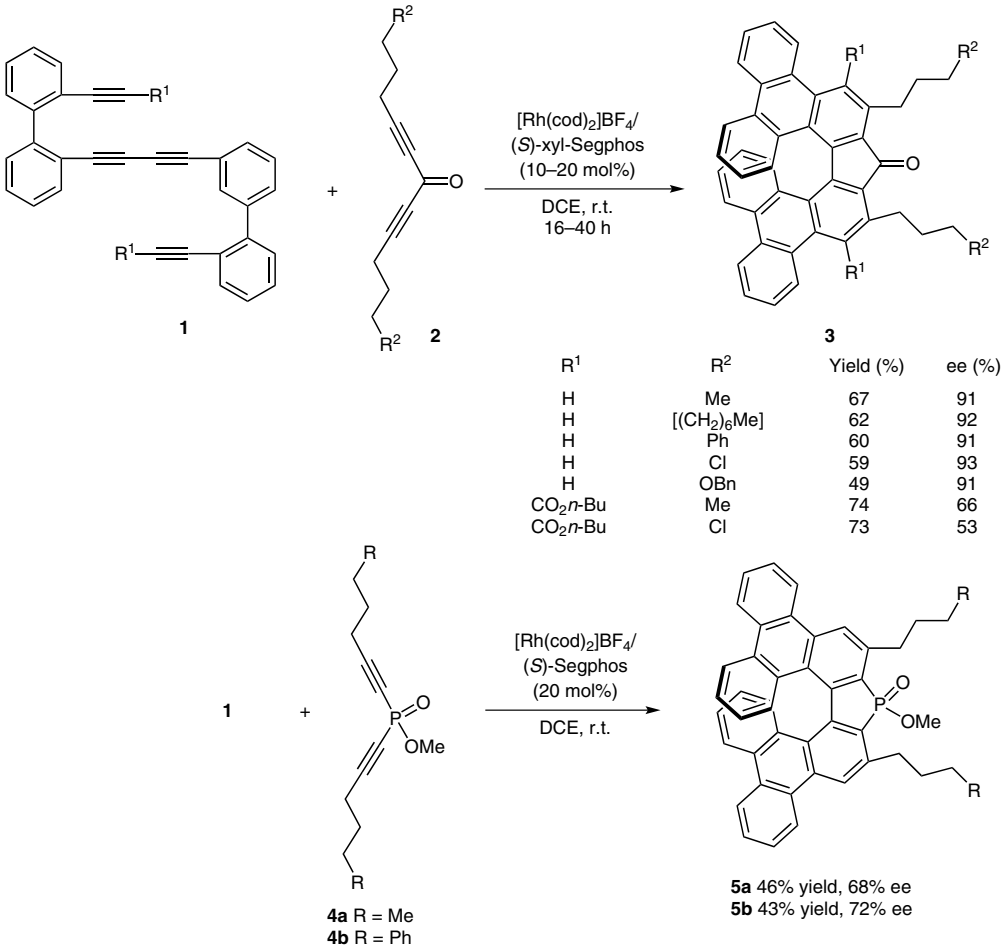
Helically Chiral 1,1′-Bitriphenylenes



R^1	R^2	Yield (%)	ee (%)
H	Me	67	91
H	$[(CH_2)_6Me]$	62	92
H	Ph	60	91
H	Cl	59	93
H	OBn	49	91
CO_2n-Bu	Me	74	66
CO_2n-Bu	Cl	73	53

Significance: The unique helical chirality of helicenes makes them attractive candidates for optical and electronic applications. This paper reports the synthesis of [7]helicenes, helically chiral 1,1′-bitriphenylenes, via rhodium-catalyzed double [2+2+2] cycloaddition. The scope of this method was examined by varying the R^1 and R^2 groups, ranging from electron-deficient to electron-rich groups, to give the corresponding helicenes in good yields (60–73%) and 60–93% ee.

Comment: The authors report a highly enantioselective method of making [7]helicenes containing fluorene, spirofluorene and phosphafluorene. Circularly polarized luminescence properties of these helicenes containing fluorene and spirofluorene are significantly larger than those of known helicene derivatives.

SYNFACTS Contributors: Timothy M. Swager, Eilaf Ahmed
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