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

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Helically Chiral 1,1'-Bitriphenylenes

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 R¹ and R² groups, ranging from electron-deficient to electron-rich groups, to give the corresponding helicenes in good yields (60–73%) and 60–93% ee.

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