P. SEHNAL, I. G. STARÁ,* D. ŠAMAN, M. TICHÝ, J. MÍŠEK, J. CVAČKA, L. RULÍŠEK, J. CHOCHOLOUŠOVA, J. VACEK, G. GORYL, M. SZYMONSKI,* I. CÍSAŘOVÁ, I. STARÝ* (ACADEMY OF SCIENCES OF THE CZECH REPUBLIC AND CHARLES UNIVERSITY, PRAGUE, CZECH REPUBLIC AND JAGIELLONIAN UNIVERSITY, KRAKOW, POLAND)

An Organometallic Route to Long Helicenes

Proc. Natl. Acad. Sci. U.S.A. **2009**, *106*, 13169-13174.

Long Helicenes by Alkyne Cycloisomerization

Significance: Helicenes have many possible applications in the areas of materials science, asymmetric catalysis, and molecular recognition; however, long helicenes represent challenging synthetic targets. Reported here is a synthetic route to undecacyclic helicenes utilizing a cobalt-catalyzed intramolecular [2+2+2] alkyne cycloisomerization. This key step forms six new rings of the helicene backbone in a single transformation.

SYNFACTS Contributors: Timothy M. Swager, David M. Chenoweth
Synfacts 2009, 11, 1221-1221 Published online: 22.10.2009
DOI: 10.1055/s-0029-1218094; Reg-No.: S11709SF

Comment: Cobalt catalysts performed better than nickel catalysts for the cycloisomerization reaction with $\text{CpCo}(\text{CO})_2/\text{Ph}_3\text{P}$ giving higher yields than $\text{CpCo}(\text{C}_2\text{H}_4)_2$ or $\text{Ni}(\text{cod})_2$. A slightly modified version of hexayne **4** underwent diastereoselective cyclization to afford a 10:90 ratio of products similar to **5** in 26% yield. Racemic helicene **7** was purified by chiral HPLC and the racemization barrier at 230 °C was found to be 37.5 kcal/mol.