Novel Approach to Heterocycles by Transition Metal Catalyzed [2+2+2] Cycloadditions

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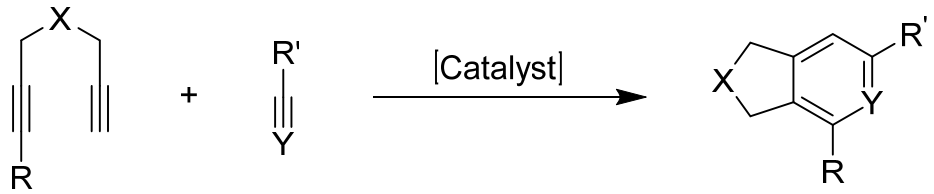
Cyclotrimerization reactions have matured in the recent decades to a valuable tool for the construction of carbo- and heterocarbocyclic ring system.[1] Transition metal complexes as suitable catalysts can now be found throughout the whole range of these metals in the periodic table, each possessing some individual properties and advantages.[2] We have specialized in cobalt-catalyzed cyclotrimerization reactions in synthetic heterocyclic chemistry, enabling the construction of complex ring structures from smaller synthons.[3] We are going to present novel heterocycles assembled by the transition metal-catalyzed [2+2+2] cycloaddition employing different metals and thereby utilizing unusual reaction conditions as well as providing the opportunity for facile further modifications of the obtained multifunctional heterocycles.



[1] K. Tanaka (Ed.) (**2013**). *Transition-Metal-Mediated Aromatic Ring Construction*. Hoboken, USA: John Wiley & Sons.

[2] M. Hapke ,N. Weding, K. Kral in *Applied Homogeneous Catalysis with Organometallic Compounds: A Comprehensive Handbook in Four Volumes, Third Edition* edited by B. Cornils, W. A. Herrmann, M. Beller, R. Paciello, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, **2018**, *1*, 375-392.

[3] P. Jungk, F. Fischer, M. Hapke, *ACS Catalysis*, **2016**, *6*, 3025-3029; F. Fischer, M. Hapke, *Eur. J. Org. Chem.* **2018**, 3193-3201.