

Self-Assembly of Chiral Alleno-Acetylinic Coordination ComplexesB. L. Quigley¹, O. Gidron¹, M. Jirásek¹, N. Trapp¹, M. Ebert¹, F. Diederich^{1*}¹ETH Zürich

Previous work in our group has established the utility of chiral phenanthroline-based alleno-acetylenic ligands in the formation of supramolecular assemblies, including double-stranded helicates,¹ triple-stranded helicates^{2,3} and catenanes.¹ In order to elucidate the factors governing selectivity in the formation of these complexes, a systematic study was undertaken on the self-assembly of alleno-acetylinic ligands bearing substituted phenanthrolines with various metal ions. These results demonstrate that the self-assembly of these supramolecular complexes is responsive to subtle changes in the structure of the phenanthroline-based ligands, the identity of the metal ion and the conditions under which self-assembly is conducted. This allows the selectivity of the system to be tuned for formation of double- or triple-stranded complexes, helicates or mesocates, and for catenation. The transfer of chirality from the alleno-acetylinic ligands to the metal ions is also highly dependent on the ligand structure, resulting in a strong influence on the enantio-/diastereoselectivity of complex formation.

[1] Ori Gidron, Michael Jirásek, Nils Trapp, Marc-Olivier Ebert, Xiangyang Zhang, François Diederich, *J. Am. Chem. Soc.* **2015**, *137*, 12502–12505.

[2] Ori Gidron, Marc-Olivier Ebert, Nils Trapp, François Diederich, *Angew. Chem. Int. Ed.* **2014**, *53*, 13614–13618.

[3] Ori Gidron, Michael Jirásek, Michael Wörle, François Diederich, *Chem. Eur. J.* **2016**, *22*, 16172–16177.