

Dynamic Helical Polymers: Sensors for the Valence of Metal Cations

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The design, synthesis and applications of helical polymers with a controlled helix sense has become a field of major interest in the last decade.[1,2] The possibility of controlling and switching the helicity of these polymers by an external stimulus (temperature, solvent, light...)[1] makes them good candidates for their use as chiral sensors, molecular devices, chiro-optical switches, memory elements for information storage, chiral catalyst and conductive materials.[1,2]

Our research group has recently demonstrated that it is possible to reverse the helix sense of a polyphenylacetylene bearing chiral pendants by adding metal salts. [3] Now we present a highly dynamic helical polymer with a novel chiral pendant[4] which presents an inactive CD spectrum. The selective interaction of the polymer with mono- and divalent metal cations induces a right or left handed helical sense of the polymer by a chiral amplification phenomenon.

References

- [1] Eiji Yashima, Katsuhiko Maeda, Hiroki Iida, Yoshio Furusho, and Kanji Nagai, Helical Polymers: Synthesis, Structures, and Functions, *Chem. Rev.*, **2009**, *109*, 6102-6211.
 [2] Sierra T.; Expression of Chirality in Polymers. In *Chirality at the Nanoscale: Nanoparticles, Surfaces Materials and more*; ed by D. B. Amabilino, **2009**, Wiley-VCH, Verlag GmbH & Co.-KGaA, Weinheim, Chap 5, pp 115-190.
 [3] Louzao, I.; Seco, J. M.; Quiñoá, E.; Riguera. R. *Angew. Chem. Int. Ed.* **2010**, *49*, 1430-1433.
 [4] Freire, F.; Seco, J. M.; Quiñoá, E.; Riguera. R. *Angew. Chem. Int. Ed.* **2011**, DOI: 10.1002/anie.201105769.

