

## Chiral Amplification, Helicity Control and Aggregation of Dynamic Helical Polymers by Metal Ions.

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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 recent years.<sup>[1,2]</sup> The possibility of controlling and switching the helicity of these polymers by an external agent<sup>[1,2,3]</sup> (temperature,<sup>[3a]</sup> solvent,<sup>[3b]</sup> light,<sup>[4]</sup> etc.) makes them suitable as chiral sensors, molecular devices<sup>[4]</sup>, chiro-optical switches, memory elements for information storage, chiral catalyst and conductive materials amongst other applications.<sup>[1,2]</sup> In our research group was recently demonstrated that it is possible to reverse the helix sense of a polyphenylacetylene bearing chiral pendants by adding metal salts. Here we present a dynamic helical polymer with a chiral pendant, which presents an inactive CD spectrum. The different interaction of the polymer with monovalent and divalent metals induces a right or left handed helical sense of the polymer. The maximum intensity of the Cotton effect in the CD spectra is reached with small amounts of metal ions (less than 10%). This fact indicates that the metal ion concentration is amplified by chiral polymer (chiral amplification). This response of the polymer to the metal ion indicates that the polymer can act as metal sensor. However, the polymer metal complex can aggregate generating nanospheres where its size and helical sense can be tuned with different polymer-metal ratios.

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