DYNAMIC HELICAL METALLOPOLYMERS: CONFORMATIONS, LUMINESCENCE, APPLICATIONS

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The study of metallopolymers with controllable helical sense remains in its infancy. Reports in the literature are rare and depict integration of the chiral element directly into the polymer backbone, leading to rigid, "*static*" helicity with high helix inversion barriers. "*Dynamic*" helical metallopolymers with low helix inversion barriers can potentially offer flexibility and adaptability, thus rendering them more amenable for development of functionality, but such systems have not been explored.

Instigated by our previous work on shape-persistent coordination frameworks [1], we have described new luminescent poly(M-salphen)-*alt*-(*m*- and *p*-phenyleneethynylene)s (M = Pt, Zn) with coilable structures [2, 3]. Saccharide-functionalized conjugated metallopolymers that display mirror-image circular dichroism spectra for L- and D-sugar sidechains respectively, signifying ordered (helical) coiling of the polymer backbone with opposite screw-sense preferences, have been developed [4]. The observation of different spectroscopic behavior and Cotton effects for a variety of solvents (in a reversible manner) and temperatures thus demonstrate the flexible, responsive and dynamic nature of the folded helical conformations in these systems.

Dynamic helical metallopolymers constitute an emerging class of functional materials, and new advances and applications as bioactive materials will be presented.

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