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Synthesis and Physical Properties of Helical Nanosized Quinoline-based Foldamers – Structure, dynamics and photoinduced electron transport

Xuesong LI
CBMN, CNRS UMR5248 (Equipe I. HUC, IECB), Bordeaux, FRANCE

Synthesis, characterization and application (photoinduced electron transport) of nanosized quinoline-based foldamers have been explored during my PhD study. With doubling segment strategy, a variety of helical nanosized foldamers (up to 96 quinoline units) were successfully prepared based on 8-aminoquinoline-2-carboxylic acid monomer.

The dynamic properties in gas phase and solution were also investigated. Ion mobility mass spectrometry afforded access to the conformation state of foldamers in gas phase; DOSY and fluorescence anisotropy assessed the diffusions (translational and rotational, respectively) of foldamers in solution. All of these techniques revealed that quinoline-based foldamers are rigid and that helical conformation is conserved.

Photoinduced electron transport (PET) through nanosized foldamers was also studied and the mechanism was revealed as multiple-step hopping mechanism.

Institut Européen de Chimie et Biologie
2, rue Robert Escarpit - 33607 Pessac, France
Tél. : +33(0)5 40 00 30 38 - Fax. : +33(0)5 40 00 22 15
www.iecb.u-bordeaux.fr