

Supramolecular organization of new chiral π -conjugated oligomers: synthesis and spectroscopic study

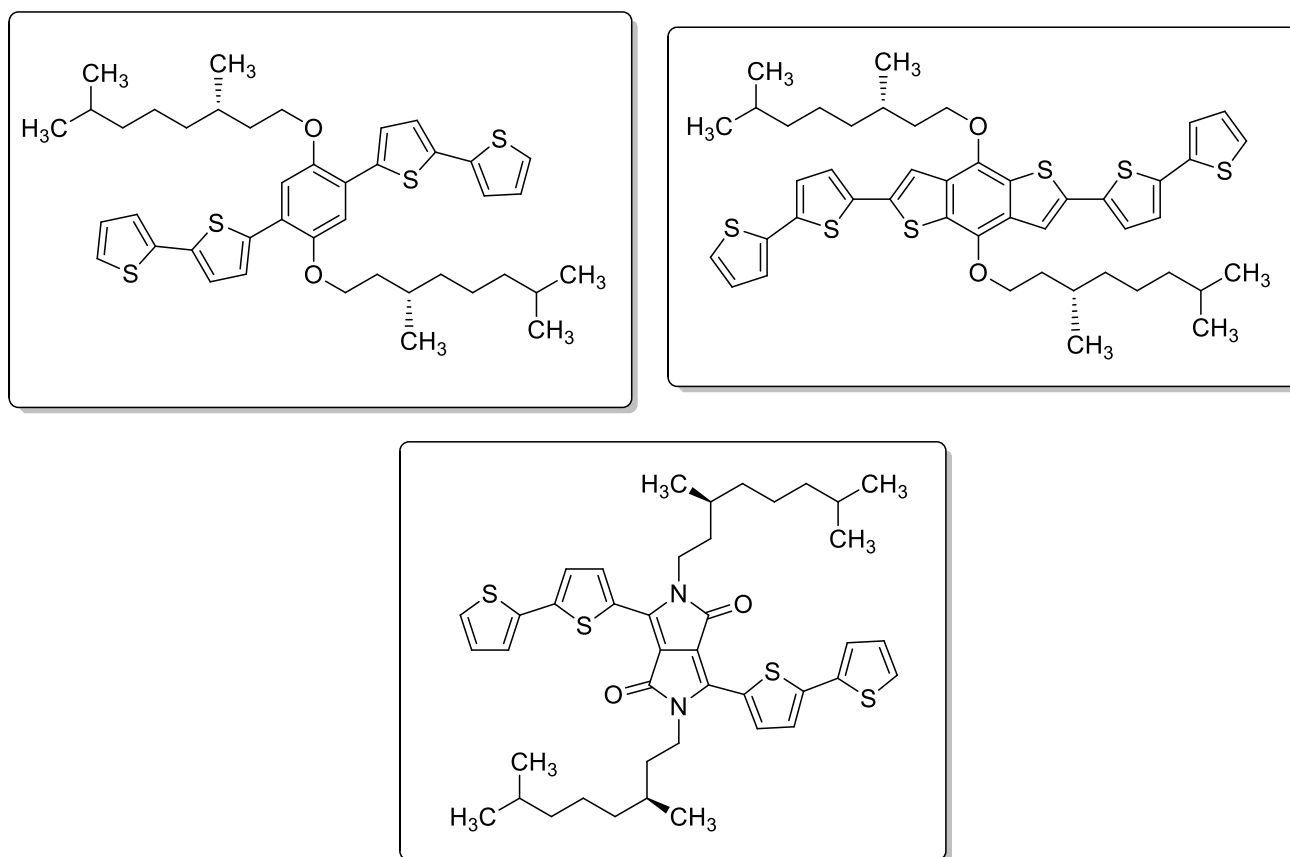
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π -Conjugated polymers and oligomers are widely used as organic semiconductors in devices such as field-effect transistors (OFET), light-emitting diodes (OLED) and solar cells (OPV)¹; in the last years, a very important role in this field has been played by oligothiophenes². Their optoelectronic properties (structure of the absorption bands, fluorescence efficiency, charge and exciton transport) depend not only on the chemical nature and the conformation assumed, but also on their supramolecular organization in the solid state. In particular, the introduction of chiral groups can be used to drive their self-assembly.

We shall summarize our recent results about the supramolecular aggregation of three new chiral π -conjugated oligomers, consisting of an aromatic central ring (1,4-hydroquinone, benzo[1,2-*b*:4,5-*b'*]dithiophene-4,8-diol, 1,4-diketopyrrolo[3,4-*c*]pyrrole) functionalized with two (*S*)-3,7-dimethyl-1-octyl groups and connected to two 2,2'-bithienyl units (see Figure).



In particular, we shall discuss: a) the synthetic route developed for the preparation of these new molecules; b) the characterization of their supramolecular aggregates in solution and of their thin films through optical (UV-VIS, fluorescence) and chiroptical (electronic circular dichroism) spectroscopies, in connection with optical microscopy investigation.

Bibliography

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- 2 D. Fichou, *Handbook of Oligo- and Polythiophenes*, Wiley-VCH, 1999.