

Conferencia: From Columnar Liquid Crystals to Carbon Nanobelts

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From Columnar Liquid Crystals to Carbon Nanobelts

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Condensed polycyclic graphene segments surrounded by solubilizing alkyl chains and electron-withdrawing or -donating substituents can give rise to optoelectronically interesting materials both because of their intramolecular pi electron structure and because of their self-assembly into stacks/columns. Especially carboxylic substituents such as ester and imide groups lead to self-assembly into columnar liquid crystalline phases and allow the modulation of donor/acceptor properties by slight changes in the substitution pattern. After a brief general introduction of columnar liquid crystals, I will both describe our efforts aiming at organic devices such as solar cells and LEDs based on columnar liquid crystalline materials, and our first results towards ribbon- and belt-like fully condensed graphene segments.

Selected recent publications:

- Order Induced Charge Carrier Mobility Enhancement in Columnar Liquid Crystal Diodes
ACS Appl. Mater. Interfaces **2013**, 5, 11935-11943
- Microresonator-enhanced electroluminescence of an organic light emitting diode based on a columnar liquid crystal
Appl. Phys. Lett. **2013**, 103, 043303
- Distorted Arene Core Allows Room-Temperature Columnar Liquid-Crystal Glass with Minimal Side Chains
Angew. Chem. Int. Ed. **2012**, 51, 5200-5203
- Highly Twisted Arenes by Scholl Cyclizations with Unexpected Regioselectivity
Angew. Chem. Int. Ed. **2011**, 50, 12582-12585
- Face-on Oriented Bilayer of Two Dicationic Columnar Liquid Crystals for Organic Donor-Acceptor Heterojunction
J. Am. Chem. Soc. **2010**, 132, 6886-6687