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Light emitting nanofibers from functionalised para-quaterphenylenes: theory, synthesis and application

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Growth of mutually aligned organic nanofibers from functionalised p-quaterphenylene has been demonstrated on a mica substrate via high vacuum sublimation. The fibers bridge the gap between microscopic and macroscopic dimensions according to their typical width in nanometer scale and length up to several hundred micrometers. They are an important step forward towards integrated nanoscopic optoelectronics since they proof that it is possible to generate ordered organic nanoaggregates from functionalised building blocks. These p-quaterphenylenes show well-organised growth with determinded morphology and emit intense blue light similar to the para-hexaphenylene.

Prior to their synthesis, more complex functionalised p-oligophenylenes have been designed using theoretical calculations to focus on the most promising molecular building blocks with respect to their functionality and NLO properties, leading to increased optical activity of the resulting nanofibers.