

Seminar über Ultrafast Science and Technology

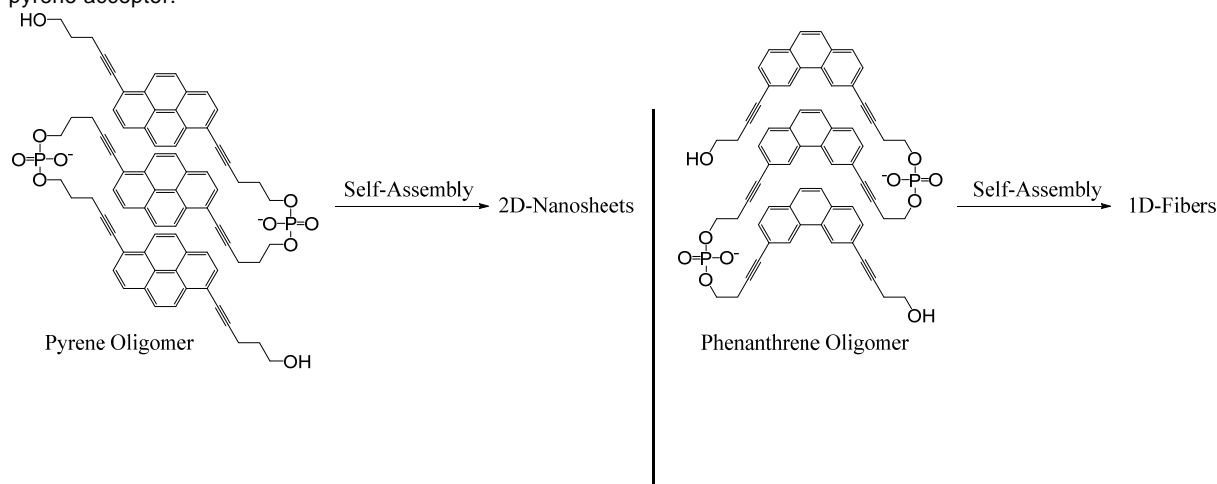
Referent/in: Caroline Bösch, Department of Chemistry and Biochemistry, University of Bern

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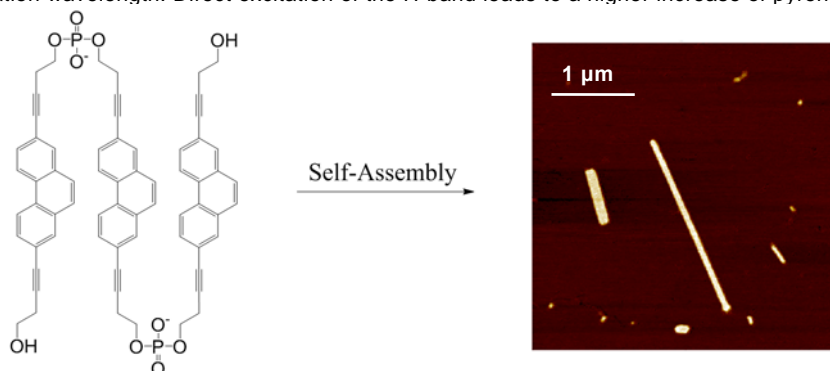
Ort: Hörsaal B116, Gebäude Exakte Wissenschaften, Sidlerstrasse 5, Bern, Schweiz

Titel: Self-Assembly of Phenanthrene-Oligomers into Nanotubes with Light-Harvesting Properties

The self-assembly of oligomers into well-defined supramolecular polymers is of large interest in material sciences [1]. In previous work we showed the formation of two-dimensional supramolecular polymers by pyrene oligomers [2] and the formation of one-dimensional supramolecular polymers by phenanthrene oligomers [3]. The latter is remarkable because the assembled phenanthrene units act as an antenna which effectively transfers its excitation energy to a pyrene acceptor.



The appearance of self-assembled nanostructures seems to depend on the substitution geometry of the phosphodiester-linked monomers. A 2,7-disubstituted phosphodiester-linked phenanthrene trimer was synthesised which forms tubular structures in aqueous medium. In combination with a pyrene acceptor the assembled phenanthrene units act as an antenna which transfers its excitation energy to the acceptor. The efficiency of the transfer depends on excitation wavelength. Direct excitation of the H-band leads to a higher increase of pyrene fluorescence intensity.



2,7-Disubstituted Phenanthrene Oligomer

[1] G. M. Whitesides, J. P. Mathias, C. T. Seto, *Science*, 1991, **254**, 1312-1319.

[2] M. Vybornyi, A. V. Rudnev, S. M. Langenegger, T. Wandlowski, G. Galzaferri, R. Häner, *Angew. Chem. Int. Ed.*, 2013, **52**, 11488-11493.

[3] C. B. Winiger, S. Li, G. R. Kumar, S. M. Langenegger, R. Häner, *Angew. Chem. Int. Ed.*, 2014, **53**, 13603-13613.