

Peripherally fused porphyrins via the Scholl reaction: synthesis, self-assembly, and mesomorphism.

Autorzy

Damian Myśliwiec

Bertrand Donnio

Piotr J. Chmielewski

Benoit Heinrich

Marcin Stępień

Rok wydania

2012

Czasopismo

Journal of the American
Chemical Society

Numer woluminu

134

Strony

4822-4833

DOI

10.1021/ja210991f

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Oxidative coupling of activated aryl groups attached to β -positions of the porphyrin ring provides convenient access to derivatives containing peripherally fused phenanthrene and benzo[*g*]chrysene units. Tetra(benzochryseno)porphyrin, reported here for the first time, contains a nonplanar, sterically locked π system and shows very intense electronic absorptions in the Q range of the electronic spectrum. Tetraphenanthroporphyrins show a tendency to aggregate in solution. In one case, a discrete dimer is formed, whose structure was investigated spectroscopically and theoretically. Derivatives bearing long alkyl chains are mesomorphic and exhibit columnar phases (tetraphenanthroporphyrins) and a monoclinic 3D phase (tetrabenzochrysenoporphyrin). The symmetry of column packing in the columnar phases is dependent on the number of alkyl chains per molecule. X-ray diffraction measurements show that, in spite of their nonplanarity, the aromatic cores in the mesophases are tightly stacked within the column. The corresponding stacking patterns were derived from the structure of the dimer, on the basis of geometrical analysis and molecular modeling.

Adres publiczny

<https://doi.org/10.1021/ja210991f>

Strona internetowa wydawcy

<https://www.acs.org/content/acs/en.html>