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２次元水素結合ラメラ相を有する強誘電性アルキルアミド置換ヘリセン誘導体

（東北大多元研）姉帯勇人、武田貴志、星野哲久、芥川智行（東北大薬）小林東、斉藤望、重野昌典、山口雅彦

Ferroelectric Alkylamide Substituted Helicene Derivative with 2D Hydrogen-Bonding Lamellar Phase

Hayato Anetai, Takashi Takeda, Norihisa Hoshino, Higashi Kobayashi, Nozomi Saito, Masanori Shigeno, Masahiko Yamaguchi, and Tomoyuki Akutagawa

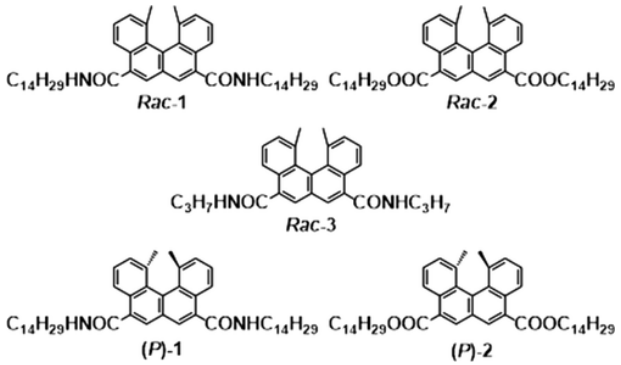


Figure 1. Molecular Structures of *Rac*-**1**, *Rac*-**2**, *Rac*-**3**, (*P*)-**1**, and (P)-**2**.

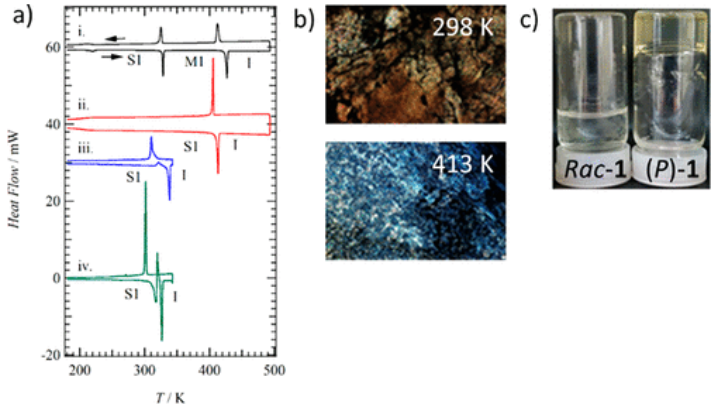
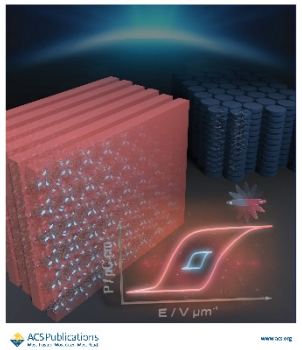


Figure 2. (a) DSC charts. (b) POM images of *Rac*-**1**. (c) Difference in organogelation behavior for *Rac*-**1** and (*P*)-**1** in chloroform–hexane.

表紙に採用



Non-π-planar helicene derivatives bearing two $-CONHC_{14}H_{29}$ chains also indicate a ferroelectric response. The racemic helicene derivative shows a bilayer lamellar liquid-crystal phase within a temperature range of 330–420 K, whereas there is no liquid crystallinity for the optically active derivative because of the different molecular assembly structure. The racemic phase is constructed through a two-dimensional (2D) N–H···O═ hydrogen-bonding network, which shows ferroelectric *P*–*E* hysteresis curves at above 340 K. The collective dipole inversion in the 2D layer contributes to the ferroelectricity in the lamellar phase.
アルキルアミド鎖を導入した非π平面型のヘリセン誘導体が強誘電性を示す事を見出した。ラセミ体は、330~420 Kで２層ラメラ液晶相を示し、その光学活性体は液晶性を示さなかった。ラセミ体は、２次元水素結合ネットワーク層を形成し、340 K以上で*P*-*E*曲線にヒステリシスを示した。２次元層内での協奏的な双極子反転がラメラ相の強誘電性に寄与している。