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材料物理和化学

芳环上氟原子对手性液晶分子扭曲力的影响

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摘要: 通过Mitsunobu反应合成了一系列手性液晶, 收率63%~71%, 并通过¹H NMR、MS、IR对其结构进行了表征。结合DSC和POM研究了目标化合物的介晶性。利用Cano's wedge法研究了目标化合物的扭曲力, 发现随着手性中心邻近芳环上氟原子数的增多, 手性液晶分子的扭曲力显著增大。实验结果表明, 氟原子的引入影响了碳氧单键的自由旋转, 导致手性液晶分子具有较少构象异构体, 从而表现出大的扭曲力。

关键词: 手性液晶 Mitsunobu反应 扭曲力 构象异构体

Influence of Fluorine Atom Attached to Aromatic Ring on Helical Twisting Power of Chiral Liquid Crystals

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Abstract: A series of chiral liquid crystals were synthesized through Mitsunobu reaction and the yields varied from 63% to 71%. The compounds were characterized by IR, ¹H NMR, MS. The mesomorphic property of objective compounds was investigated by DSC and POM. The helical twisting power (HTP) was determined by Cano's wedge method. It was found that HTP increased with the increase of the number of Fluorine atom attached to aromatic ring. The inducing of fluorine atom to aromatic ring influence the rotation of C—O bond, then chiral molecule has small number of conformation and exhibits high HTP.

Keywords: chiral liquid crystals Mitsunobu reaction helical twisting power conformational isomers

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