

The ferrocene-ferrocenium redox-active system for the design of switchable mesomorphic materials

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The peralkylated ferrocene unit is a suitable building-block to obtain ionic liquid crystals.^(1,2) When substituted by small mesogens or dendritic entities, the peralkylated ferrocene can be easily oxidized into ferrocenium. For low molar-mass compounds, we have shown that it is possible to generate liquid-crystalline properties from non-mesomorphic materials upon oxidation of ferrocene with silver tosylate; smectic A and rectangular columnar phases were observed.^(3,4) On the other hand, electron transfer was also applied to switch between mesophases, such as nematic and smectic phases (see below). In general, ionic interactions tend to stabilize lamellar mesophases. When ferrocene is substituted by a dendron (one example is shown below), the latter plays a crucial role: a switch is observed only for flexible dendrons.

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