Fullerene-Containing Thermotropic Liquid Crystals from Non-Symmetrical Mesomorphic Dendrimers

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Functionalization of fullerene with liquid-crystalline addends led to materials showing interesting mesomorphic properties. The use of dendritic addends was particularly successful as the liquid-crystalline behavior could be controlled as a function of the dendrimer generation. The fullerenes were prepared from either liquid-crystalline malonate derivatives (Bingel-reaction) or liquid-crystalline aldehyde derivatives (1,3-dipolar cycloaddition reaction).

Recently, we demonstrated that it is possible to tune the supramolecular organization of the mesomorphic fullerene-based molecular units within the liquid-crystalline assemblies by the use of non-symmetrical dendritic addends. This result is of particular interest with the view to develop materials with tailor-made properties.

The design, synthesis and properties of the title compounds will be presented.