Triptycene Based Arrays of Dipolar Molecular Rotors

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A new generation of rod-shaped molecules for controlled formation of well-organized two-dimensional arrays of dipolar rotors with expected ferroelectric properties was designed and synthesized. Two different approaches to such arrays were tested: (i) Formation of surface inclusions between molecular rotor guests and hexagonal tris(o-phenylenedioxy)cyclotriphosphazene (TPP) host. The rotors contain a triptycene unit as an efficient stopper preventing complete insertion into the host channels. (ii) Formation of a Langmuir-Blodgett monolayer of molecular rotors on an aqueous subphase and its transfer to a solid substrate. These molecular rotors contain a carboxylate as an anchoring group. Their triptycene units interlock into a triangular network with the rotatable dipoles at lattice points.

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