Title:	Liquid-Crystalline Star-Shaped Supergelator Exhibiting Aggregation-Induced Blue Light Emission
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Abstract:	A family of closely related star-shaped stilbene-based molecules containing an amide linkage are synthesized, and their self-assembly in liquid-crystalline and gel states was investigated. The number and position of the peripheral alkyl tails were systematically varied to understand the structure–property relation. Interestingly, one of the molecules with seven peripheral chains was bimesomorphic, exhibiting columnar hexagonal and columnar rectangular phases, whereas the rest of them stabilized the room-temperature columnar hexagonal phase. The self-assembly of these molecules in liquid-crystalline and organogel states is extremely sensitive to the position and number of alkoxy tails in the periphery. Two of the compounds with six and seven peripheral tails exhibited supergelation behavior in long-chain hydrocarbon solvents. One of these compounds with seven alkyl chains was investigated further, and it has shown higher stability and moldability in the gel state. The xerogel of the same compound was characterized with the help of extensive microscopic and X-ray diffraction studies. The nanofibers in the xerogel are found to consist of molecules arranged in a lamellar fashion. Furthermore, this compound shows very weak emission in solution but an aggregation-induced emission property in the gel state. Considering the dearth of solid-state blue-light-emitting organic materials, this molecular design is promising where the self-assembly and emission in the aggregated state can be preserved. The nonsymmetric design lowers the phase-transition temperatures.The presence of an amide bond helps to stabilize columnar packing over a long range because of its polarity and intermolecular hydrogen bonding in addition to promoting organogelation.
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