Title:	Electroluminescent Aggregation-Induced Emission-Active Discotic Liquid Crystals Based on Alkoxy Cyanostilbene-Functionalized Benzenetricarboxamide with Ambipolar Charge Transport
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Abstract:	There is significant demand for molecular functional materials with tailored light-emissive and charge transport properties for their utilization in organic optoelectronic devices. Motivated by such promising properties, we present the synthetic design and emissive and semiconducting properties of aggregation-induced emission (AIE)-active columnar discotic liquid crystals based on cyanostilbene-modified benzenetricarboxamide derivatives (1a, 1b, and 1c). Enantiotropic mesomorphic behavior over a wide temperature range, including room temperature, with columnar hexagonal self-assembly was observed for all of the compounds. The space-charge limited current (SCLC) technique revealed the ambipolar charge transport for reported materials with balanced electron and hole transport of the order of 10–3 cm2/(V s). On the other hand, all of the compounds 1a–c were tested as emitter materials in solution-processed organic light-emitting devices at different concentrations with several hosts, viz., poly(vinylcarbazole) (PVK), 1,3-bis(N-carbazolyl)benzene (mCP), bis[3,5-di(9H-carbazol-9-yl)phenyl]diphenylsilane (SimCP2), and (carbazolyl)-1,10-biphenyl (CBP). The maximum luminance of 1255 cd/m2 corresponding to sky-blue emission was observed for compound 1a at 3.0 wt % with the CBP host.
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