

## **Bent-Core LC Elastomers and Side-Chain LC Polymers Using Reactive Bent-Core Mesogens**

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### **Abstract**

Bent-core liquid crystals (LCs) exhibit novel phase behaviour as well as potentially useful properties for functional devices, and the incorporation of bent-core LCs into polymeric materials provides a method to make stable and functional LC materials for such device applications. In this contribution, we present a method for making bent-core LC elastomers and side-group LC polymers (SGLCPs) using reactive bent-core LC mesogens. These reactive mesogens can be incorporated into LC elastomers, linear homopolymers, and block copolymers. We focus on nematic bent-core LCs and characterize the phase behaviour, electro-optic properties, flexoelectric response, and structural properties of the nematic bent-core elastomers and polymers. Bent-core elastomers show a nematic phase down to room temperature as well as an enhanced flexoelectric response, and small-angle x-ray scattering (SAXS) reveals temperature dependent structural changes in the bent-core mesogens. SGLCPs exhibit a broad nematic phase and are soluble in the room temperature nematic solvent 5CB. SAXS of pure SGLCP as well as SGLCP in 5CB reveals the interplay between polymer conformation and LC director alignment as well as a characteristic bent-core nematic scattering pattern. Finally, SGLCPs can be used to make block copolymers that incorporate bent-core LCs, paving the way for novel nanostructure formation by polymeric self-assembly.

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