

Structure and pyroelectric behaviour of new bent core mesogen

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The new rigid bent core liquid crystal (LC) compound – bis- $\{3,4,5\text{-tri}[4\text{-}(4\text{-}n\text{-nonyloxybenzoyloxy})]\text{benzoylamino}\}$ -1,3-phenylene (**I**) – (fig. 1) has been synthesized [1]. The properties of the compound have been studied by thermal polarized light microscopy and differential scanning calorimetry. The X-ray diffraction studies were performed using synchrotron radiation. The high-temperature chiral polar SmC-phase (SmCP) has been found in a narrow temperature region above 287.0 °C (fig. 2 and 3). Below this temperature the compound is crystalline. The study of pyroelectric properties of crystalline samples was carried out in thin film form (thickness of 1 ÷ 2 μm). The sandwich-like samples (metal – thin film – metal), typically used in solid-state microelectronic technology, revealed spontaneous pyroelectric activity with pyroelectric coefficient $\gamma = 0.4 \text{ nC}\cdot\text{cm}^{-2} \text{ K}^{-1}$, fig. 4.

References

(1) M.A. ZHAROVA, V.V. BYKOVA, N.V. USOL'TSEVA. *J. LIQUID CRYSTALS AND THEIR APPLICATION*. **2007**, VOL. 4, P. 78. (RUSS.).

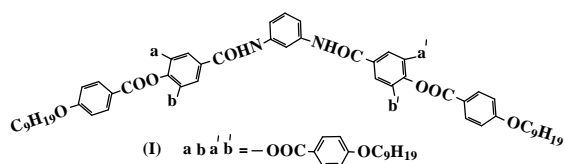


Figure 1. Structural formula of compound **I**.

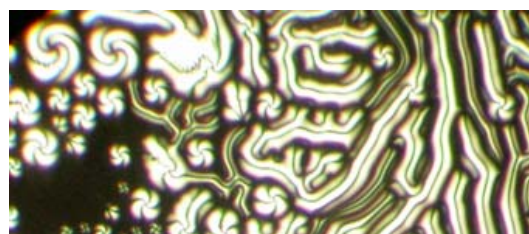


Figure 2. Optical photomicrograph of SmCP phase growing from isotropic phase.

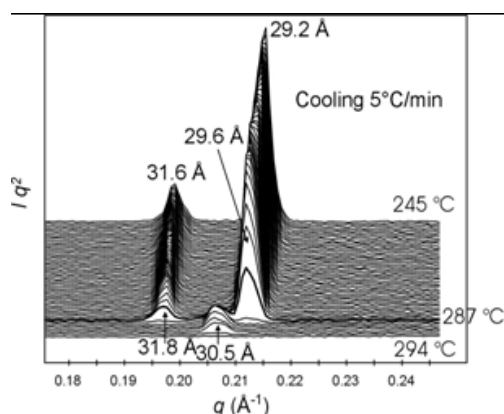


Figure 3. Small angle x-ray scattering (SAXS) patterns as a function of temperature (°C). The layer spacing of LC phase is 30.5 Å.

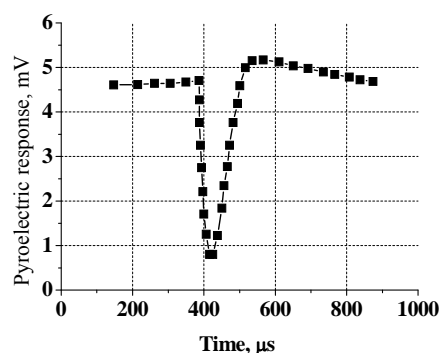


Figure 4. Oscillogram of the pyroelectric response of compound **I** at room temperature.