



	<b>Experiment title:</b> X-ray diffraction study of the potential biaxial and ferroelectric nematic phase in a new class of banana-shaped mesogens	<b>Experiment number:</b> SC-3232
<b>Beamline:</b> ID02	<b>Date of experiment:</b> from: 25 August 2011 to: 28 August 2011	<b>Date of report:</b> 27 February 2014
<b>Shifts:</b> 8	<b>Local contact(s):</b> Manuel Fernandez-Martinez	<i>Received at ESRF:</i>

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**Report:**

The experimental results have been published in the paper

F.Vita, I. F. Placentino, C. Ferrero, G. Singh, E. T. Samulski, O. Francescangeli, "Electric field effect on the phase diagram of a bent-core liquid crystal", *Soft Matter* **9**, 6475-6481 (2013),

whose abstract is reported below

*We have investigated the effects of a low frequency electric field on the thermotropic behavior of a nematogenic bent-core liquid crystal by means of X-ray diffraction. We have determined for the first time the 2D phase diagram of the bent-core mesogen over an extended temperature-field (T, E) space. The results show that the electric field strongly affects both the mesophase sequence and the transition temperatures of the sample. An extraordinary field-induced shift of the nematic–isotropic phase transition is found, which has neither any experimental counterpart in conventional calamitic LCs, nor can be explained by the presently available theories. The phase diagram points out the existence of exotic phase transitions driven by either electric field or temperature along specific paths in the (T, E) space. In particular, the isothermal field-induced transition from the  $N_{CybC}$  to the  $N_{CybA}$  phase represents a breakthrough in the interpretation of previous XRD experimental results. These experimental findings provide further strong support of the now widely accepted cybotactic cluster picture of the nematic phase of bent-core mesogens.*