Small Angle Scattering on Cholesteric Liquid Crystals

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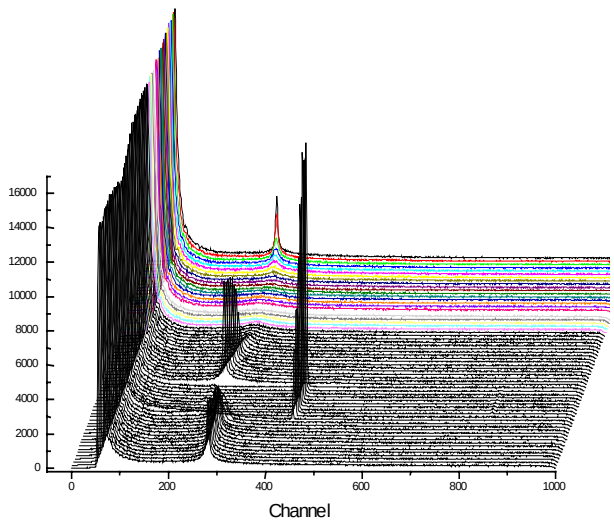
The organization in a flowing liquid crystalline system has a coupling between flow direction, the symmetry axis of the anisometric units and the orientation of these units due to interaction with the wall of the cell containing the sample. In systems formed by ionic amphiphiles a perturbation in the double electrical layer will influence the inter-aggregate interactions. Eventually the extent of such perturbations can promote a phase transition, through a change in the shape of the units or a different spatial distribution of them. The interaction forces between the units in organized systems can have a non-newtonian nature.

We performed small angle X-ray scattering measurements on the EMBL beam-line X33 using continuous heating and cooling scans at 1°C/min, Figure 1. It can clearly be seen the changes in the scattering patterns as the temperature has changed, indicating phase transitions. However, the patterns show only one clearly identifiable peak, making the structure of phase assignment difficult. Complementary experiments, using other techniques, such as polarising optical microscopy, POM, are required for a proper interpretation of the results. A detailed analysis of the results is in progress.



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