

## Experiment Report Form

**The double page inside this form is to be filled in by all users or groups of users who have had access to beam time for measurements at the ESRF.**

Once completed, the report should be submitted electronically to the User Office via the User Portal:

<https://www.esrf.fr/misapps/SMISWebClient/protected/welcome.do>

### ***Reports supporting requests for additional beam time***

Reports can be submitted independently of new proposals – it is necessary simply to indicate the number of the report(s) supporting a new proposal on the proposal form.

The Review Committees reserve the right to reject new proposals from groups who have not reported on the use of beam time allocated previously.

### ***Reports on experiments relating to long term projects***

Proposers awarded beam time for a long term project are required to submit an interim report at the end of each year, irrespective of the number of shifts of beam time they have used.

### ***Published papers***

All users must give proper credit to ESRF staff members and proper mention to ESRF facilities which were essential for the results described in any ensuing publication. Further, they are obliged to send to the Joint ESRF/ ILL library the complete reference and the abstract of all papers appearing in print, and resulting from the use of the ESRF.

Should you wish to make more general comments on the experiment, please note them on the User Evaluation Form, and send both the Report and the Evaluation Form to the User Office.

### **Deadlines for submission of Experimental Reports**

- 1st March for experiments carried out up until June of the previous year;
- 1st September for experiments carried out up until January of the same year.

### **Instructions for preparing your Report**

- fill in a separate form for each project or series of measurements.
- type your report, in English.
- include the reference number of the proposal to which the report refers.
- make sure that the text, tables and figures fit into the space available.
- if your work is published or is in press, you may prefer to paste in the abstract, and add full reference details. If the abstract is in a language other than English, please include an English translation.



	<b>Experiment title:</b> Exploring the nematic order of liquid crystal thermosets: a real-time investigation of cross-linking reactions	<b>Experiment number:</b> MA-2811
<b>Beamline:</b> BM26B	<b>Date of experiment:</b> from: 02 October 2015 to: 05 October 2015	<b>Date of report:</b> 12 March 2020
<b>Shifts:</b> 9	<b>Local contact(s):</b> Daniel Hermida Merino	<i>Received at ESRF:</i>
<b>Names and affiliations of applicants</b> (* indicates experimentalists): Dr. F. Vita*, Prof. O. Francescangeli*, Dr. M. Pisani*, Dip. SIMAU, Università Politecnica delle Marche, via Breccie Bianche, I-60131, Ancona, Italy		

## Report:

The experimental results have been published in the paper

F. Vita, F. C. Adamo, M. Pisani, L. M. Heist, M. Li, M. Hegde, T. J. Dingemans, E. T. Samulski, O. Francescangeli, "Liquid crystal thermosets. A new class of high performance materials", *Liq. Cryst.* (2019), DOI: 10.1080/02678292.2019.1641233,

whose abstract is reported below

*The evolution of the liquid crystalline order during the cure of a reactive thermotropic liquid crystal (LC) is studied using two phenylethynyl-terminated biphenol and naphthalenediol model compounds. The nematic order in the melt of both model compounds at elevated temperature is monitored with X-ray Diffraction (XRD) and C-13 Nuclear Magnetic Resonance (13C NMR). XRD shows a cybotactic nematic phase; the global nematic order decreases with curing and eventually the resulting cross-linked liquid crystal thermoset (LCT) exhibits an isotropic morphology. The NMR method tracks the phenylethynyl end-group and yields data about the cure kinetics of this class of reactive LC mesogens. The observations may be used to make inferences about the cure behaviour and morphology of phenylethynyl-terminated random copolyester macromonomers.*