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**DUTCH-BELGIAN BEAMLINE
AT ESRF**

Experiment Report Form

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.

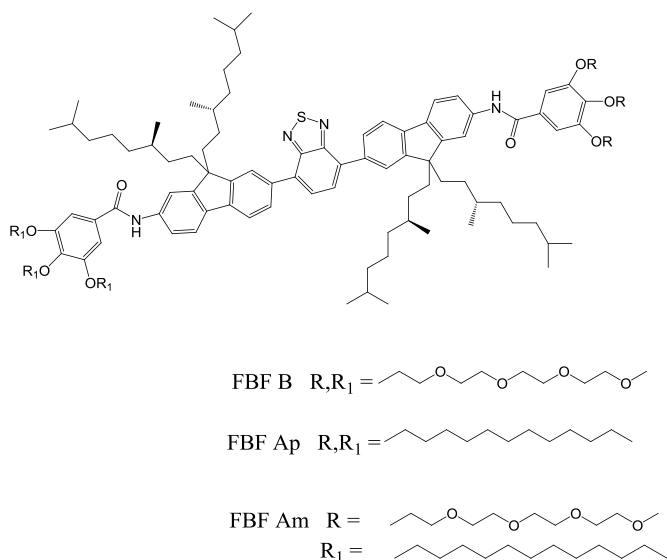
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	Experiment title: Self assembling behavior of bolaamphiphilic oligofluorene hollow nanostructures	Experiment number: 26-02-546
Beamline: BM 26B	Date(s) of experiment: From: 07-02-2011 To: 14-02-2011	Date of report: 25-10-2011
Shifts: 12	Local contact(s): Dr. Guiseppe Portale	
Names and affiliations of applicants (* indicates experimentalists): Dr. D. Dasgupta* , Dr. A.P.H.J. Schenning and Prof. Dr. D. J. Broer Functional Organic Materials and Devices, Eindhoven University of Technology		

Report:

The main goal of this investigation is to investigate the size and supramolecular organization of the self assembled microstructures of novel oligofluorene based π -conjugated amphiphiles, which produce fluorescent organic nanoparticle in aqueous solution under high dilution condition (nanomolar) ^{1,2}. In order to investigate the aggregation behavior involved in these organic nanoparticle formation, we have used three differently functionalized building blocks, namely FBF-B (bolaamphiphile), FBF-Am (amphiphile) and FBF-Ap (apolar) (Scheme-1). The nanoparticles were formed when 15 μ L of 1 mM THF stock solution containing one of the fluorene derivatives, was rapidly injected into 5 mL of milli-Q water. The SAXS spectra were taken immediately using a set-up of S-D distance of 7 m.



Scheme-1: Chemical structures of the supramolecular building blocks used in this study

The SAXS profiles thus obtained (Figure-1) indicate the formation of spherical nanoobjects in the solution³. The experimentally obtained scattering curves were compared with those simulated, considering polydisperse size distribution. The SAXS results along with their best fit approximations well correspond to the nanoparticle diameters observed in TEM and DLS studies within their error limits. Moreover, in all cases,

the best fit curves are those with a solid sphere approximation, thus discarding the possibility of vesicular structure formation.

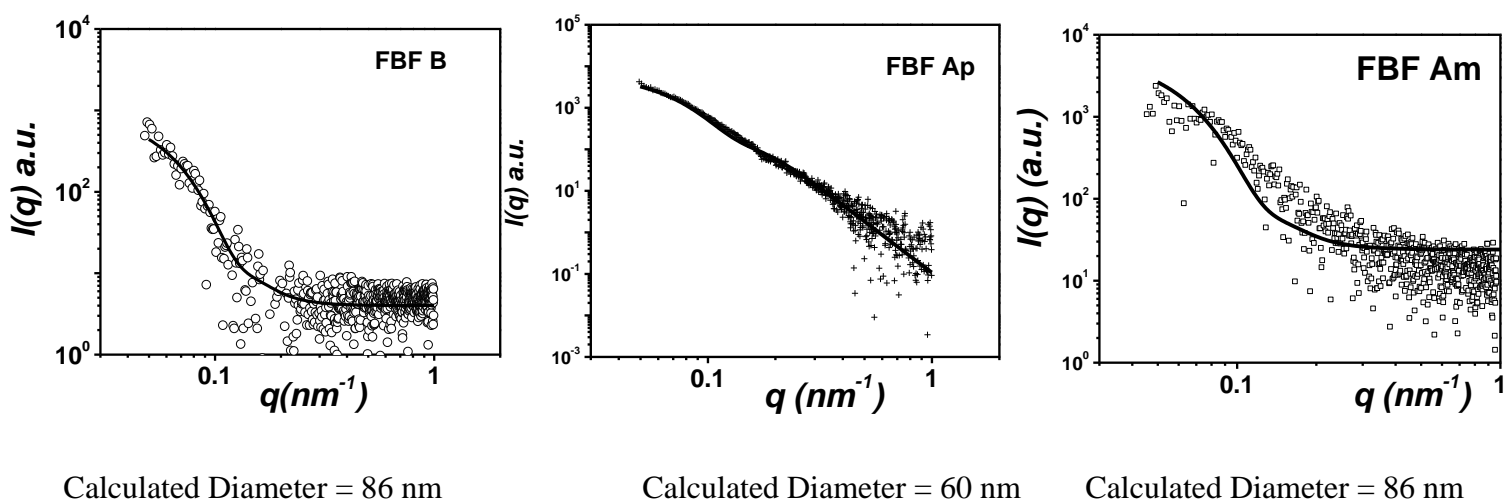


Figure-1: SAXS profiles of the oligofluorene nanoparticles recorded during experimental beamtime 26/02/546. The symbols indicate the experimental scattering whereas the solid lines represent the best fits.

In conclusion, we have established the size and morphology of our oligofluorene nanoparticles formed in solution and we are currently writing manuscripts that include these important results.

¹ R. Abbel, R. van der Weegen, E.W. Meijer and A.P.H.J. Schenning, "Multicolour self-assembled particles of fluorene-based bolaamphiphiles", Chem. Commun. 2009,1697.

² R. Abbel, R. van der Weegen, W. Pisula, M. Surin, P. Leclère, R. Lazzaroni, E.W. Meijer and A.P.H.J. Schenning, "Multicolour Self-Assembled Fluorene Co-Oligomers: from Molecules to the Solid State via White-Light-Emitting Organogels", Chem. Eur. J. 2009, 15, 9737.

³ O. Glatter and O. Kratky *Small-angle X-ray Scattering*; Academic Press, London, 1982.