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ESRF

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 using the **Electronic Report Submission Application:**

http://193.49.43.2:8080/smis/servlet/UserUtils?start

Reports supporting requests for additional beam time

Reports can now 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.

ESRF	**Experiment title:** Structure vs Performance	**Experiment number**: ME161
Beamline: ID11, ID2, ID13	**Date of experiment**: from: to:	**Date of report**: Sept 1st, 2002
Shifts:	**Local contact(s)**: Dr. A. Terry, Dr. Volker Urban, Dr. Christian Riekel	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

C.S.J. Corstjens, L. Kurelec, A. Rastogi, F. vander Burgt, J.G.P. Goossens, J. Hobbs, A. Terry, C. Riekel, M.E.L. Wouters, F.H.M. Swartjes, B. Schrauwen, S. Rastogi

All have contributed to experiments at different stages

Report:

Refereed papers from last 18 months as a result of experiments performed at ESRF under proposal ME-161

Quiescent studies:

1. Influence of thermal treatments on polmorphism in stereoirregular isotactic polypropylene; effect of stereo-defect distribution F.P.T.J. van der Burgt, S. Rastogi, J.C. Chadwick, B. Rieger *; J. Macromol. Sci.* 2002, Physics *B41*, 1091-1104.

2. Time-resolved WAXD and SAXS investigations on butyl branched alkane at elevated pressure A. Rastogi, S. Rastogi, J. Hobbs; *Macromolecules* 2002, *35*, 5861-5868.

3. A comparative study on gels and clathrates of syndiotactic polystyrene; solvent mobility in polymer-solvent compounds C.S.J. van Hooy-Corstjens, P.C.M.M. Magusin, S. Rastogi, P.J. Lemstra ; *Macromolecules* 2002, *35*, 6630-6637.

4. Fully sintered high fatigue resistance Utra High Molecular Weight Polyethylene (UHMW-PE) for knee prosthesis L. Kurelec, S. Rastogi, M. Wimmer, P.J. Lemstra; *Nature* 2002 (R01186) under reviewing process.

5. Molecular organization of branched polymers at elevated pressure-temperature.2: "Open-orthorhombic" lattice in ethylene-1-octene copolymers ; A. Rastogi, A. Terry, S. Rastogi, V.B.F. Mathot; *Macromolecules* 2002, MA020761H, under reviewing process

6. Morphology of Neutralized Low Molecular Weight Maleated Ethylene-Propylene Copolymers (MAn-g-EPM) As Investigated by Small-Angle X-ray Scattering, M.E.L. Wouters, J.G.P. Goossens, F.L. Binsbergen**,** *Macromolecules* 2002**,** 35, 208-216.

7. Polymorphism in syndiotactic polypropylene; thermodynamic stable regions for Form I and Form II in pressure-temperature phase diagram. ; S. Rastogi, D. La Camera, F.vander Burgt, A. Terry, S.Z. Cheng *;* *Macromolecules* 2001, **34** (22), 7730–7736

8. Pressure crystallization under high pressure, S. Rastogi, L. Kurelec "*The Encyclopedia of Materials: Science and Technology*" ISBN:0-08-0431526 pp. 7261-7267 (2001)

9. Chain mobility in polymer systems; on the borderline between solid and melt; Lada Corbeij-Kurelec *PhD-Thesis*, Eindhoven University of Technology, 2001; ISBN no. 90-386-3032-8, 1-152.

10. Polymer-Solvent Compounds; a route to make new polymer structures; C.S.J. Corstjens *PhD-Thesis*, Eindhoven University of Technology, 2002; ISBN no. 90-386-2663-0, 1-110.

Patents:

11. European Patent application no. 01000581.7. dated 30th October 2001 on "Process for the manufacturing for the shaped part of Ultra High Molecular Weight and a fibre made with this process". Inventors: S. Rastogi and L. Kurelec

12. European Patent application no. 01203865.9. dated 12th October 2001 on "Process to sinter ultra high molecular weight polyethylene; a novel route to high fatigue resistance material" . Inventors: S. Rastogi and L. Kurelec

Flow studies:

13. Polymer structure development during flow; J.G.P. Goossens, S. Rastogi, H.E.H. Meijer, P.J. Lemstra; "*The Encyclopedia of Material Science and Technology*" ISBN:0-08-0431526 pp. 7518-7522 (2001)

14. Processing flexible polymers to high performance fibers; P.J. Lemstra and S. Rastogi*;* "*The Encyclopedia of Materials: Science and Technology*" ISBN:0-08-0431526 pp. 7877-7883 (2001)

15. Stress Induced Crystallization in Elongational Flow; F.H.M. Swartjes, *PhD-Thesis*, Eindhoven University of Technology, 2001; ISBN no. 90-386-3052-2, 1-136.

Polymer properties:

16. Rubber modified glassy amorphous polymers prepared via chemically-induced phase separartion: 1. Morphology development and mechanical properties; B.J.P. Jansen, S. Rastogi, H.E.H. Meijer, P.J. Lemstra; *Macromolecules* 2001, *34*, 3998 - 4006

17. Rubber modified glassy amorphous polymers prepared via chemically-induced phase separartion: 2. The mode of microscopic deformation studied by in-situ small angle X-ray scattering during tensile deformation. ; B.J.P. Jansen, S. Rastogi, H.E.H. Meijer, P.J. Lemstra; *Macromolecules* 2001, *34*, 4007 – 4018

18. Morphology of Ethylene-Propylene Copolymer based Ionomers as Studied by Solid State NMR and Small Angle X-Ray Scattering in Relation to Some Mechanical Properties; M.E.L. Wouters, F.L. Binsbergen, and J.G.P. Goossens, V.M. Litvinov, M. van Duin, and H.G. Dikland, *Macromolecules* 2002 in press

19. Ionomeric thermoplastic elastomers based on ethylene-propylene copolymers : preparation, structures and properties, M.E.L. Wouters. *PhD-Thesis*, Eindhoven University of Technology, 2001, ISBN 90-386-3051-4.