ESRF	**Experiment title:** Influence of pressure on hydrogen bonded polymers; polyamides and biopolymers	**Experiment number**: SC1279
Beamline: ID11	**Date of experiment**: from: July 24th 2004 to: August 4th 2004	**Date of report**: January 14th 2005
Shifts: 29	**Local contact(s)**: Silvia Capelli	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

Rachel Mosia, Ann Terry, Sanjay Rastogi, Luigi Balzano, Jan Willem Housmans, Guido Heunen, Joost Valeton

Report: The polymers of poly-4-methyl-pentene-1 used in this study were synthesized in our laboratory. For copolymers the number on the name relates to the comonomer content.

Table 1. Characteristics of polymers used

Sample	% 1-pentene	M_w (kg/mol)	T_m (°C)
P4M1P-1	0	26	228
P4M1P-2	0	100	232
Poly[(4M1P)-*co*-(1-pentene)]-20	20	97	208
Poly[(4M1P)-*co*-(1-pentene)]-30	30	111	186
Poly[(4M1P)-*co*-(1-pentene)]-42	42	141	157
Poly[(4M1P)-*co*-(1-pentene)]-48	48	154	129

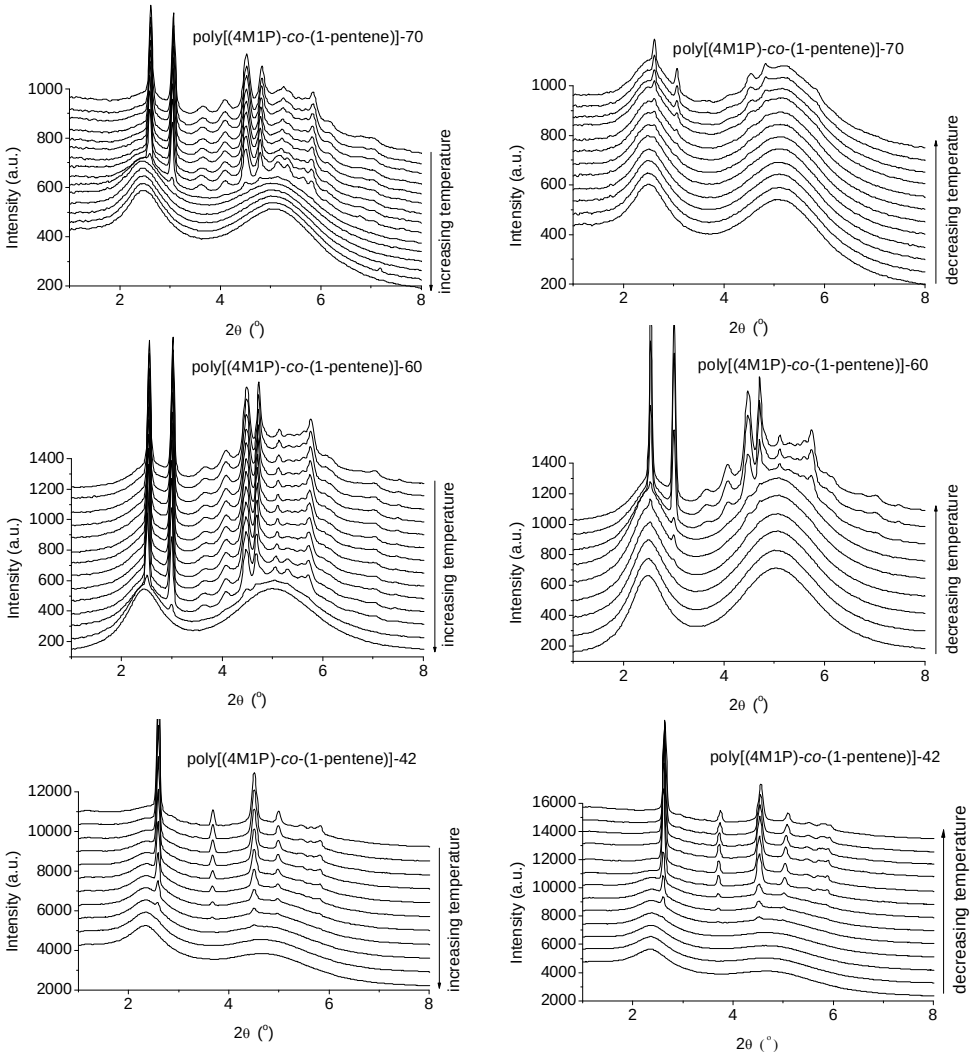

Figure 1. A series of the X-ray diffraction patterns of different copolymers recorded *in-situ*, on increasing and decreasing temperature at atmospheric pressure.

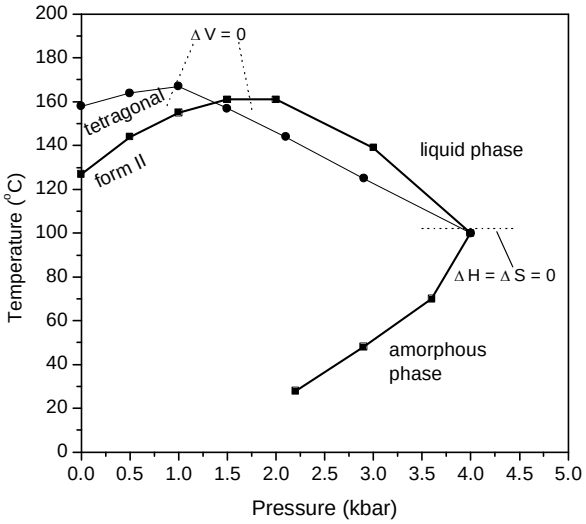

Figure 2. After a series of WAXD proposed phase diagram of the copolymer with 42 mol% 1-pentene is proposed.

For details please see published thesis by "Homo- and copolymers of 4-methyl-1-pentene : the use of metallocene catalysts for the synthesis of polymers that expand upon cooling from the melt / by Mamoeletsi Rachel Mosia Eindhoven University of Technology 06th Dec 2004; ISBN 90-386-2766-1; http://alexandria.tue.nl/extra2/200413170.pdf